HEALTH IN HOME AND TOWN

BROWN



REVISED

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HEALTH IN HOME AND TOWN

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BY

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REVISED

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PREFACE

It is generally acknowledged that the environment in which a child lives has a marked influence upon his life. He has already learned in "Good Health for Girls and Boys" some of the essential principles of personal hygiene. It is to be hoped that he is now practising them. This book will teach him to be intelligent not only about his personal home, but also about his greater home, the town or city.

In teaching the first ten chapters, illustrative material may be found on every hand. The rooms of the schoolhouse will be especially valuable when they illustrate the home, because they are convenient and all of the pupils may observe them at the same time. The pupils may be encouraged to bring certain objects from home, and to start a collection of pictures and simple magazine articles that will illustrate the subject. Sometimes pupils whose parents are employed in building or decorating houses may give or loan material very valuable for study. Great tact, however, is necessary in talking about the home so that the children shall acquire a helpful attitude rather than a critical one.

In studying the second half of the book, excursions and some personal work by the pupils will be very valuable. An entire class may visit some point of interest, as the city water-supply or the lighting plant. The pupils may go individually or in small groups, on Saturdays, to the parks and playgrounds and make reports on their trips.

The same methods of teaching should be used in hygiene as have already made geography and arithmetic live, interesting, and profitable studies. When a new topic is to be studied in hygiene an interest may be awakened by encouraging the pupils to gather all the information possible on the subject. Direct observation,

magazine articles, newspaper clippings, library books, and talks with their parents furnish the means. Their efforts may be directed by a set of questions put on the board and a few minutes set aside on a later day to hear their reports upon them. After sufficient facts have been gathered, reading the chapter on the subject in the book will have an added value.

In grammar schools, the teaching of physiology and hygiene is generally far behind much of the best instruction in the other subjects of the curriculum. It is the hope that this book with the others of the series may prove a valuable help alike to teacher and pupil.

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THE HOUSE

The cornerstone in Truth is laid,
The guardian walls of Honor made,
The roof of Faith is built above,
The fire upon the hearth is Love:
Though rains descend and loud winds call,
This happy house shall never fall.

HENRY VAN DYKE

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HEALTH IN HOME AND TOWN

I. THE HEALTHFUL HOME

North, south, east, or west,
A man's own home is ever the best.
House Motto.

Good Health. — Good health is one of the chief factors of a successful life. Without health, we are disappointed and handicapped at every step. Good health is the foundation of a forceful character. It encourages the growth of all those attractive qualities which we admire in others, such as cheerfulness, courage, and perseverance. Mrs. Alice Freeman Palmer has said, "Cultivate cheerfulness as a virtue and an accomplishment. It is marvelously contagious. A sunny disposition is worth more than any talent."

The Efficient Worker. — To be of value in the world, we must be efficient. Promptness, quickness, knowledge, and training can produce the best results only when we are well and strong. We should cherish our health as a most valued possession.

Right Living. —Good health is dependent upon a great many conditions. It is very important to form and to cultivate right habits of living. Healthfulness depends upon proper exercise, deep breathing, fresh air, right eating, cleanliness, and suitable clothing. Many of these matters we can regulate, individually, for ourselves.

The Healthful Home. — A sanitary home is one of the greatest aids in keeping well. To be sanitary, a home must be clean. All the drains should be tight and in good working order. The garbage, ashes, and rubbish should be removed from the house regularly and promptly. Running water is a great aid in keeping a house clean, but there are many healthful homes situated in the country without this convenience.

Other Helps. — A sunny, dry location is desirable for the home. Plenty of room for the various activities of the members of the family, as cooking, eating, resting, and playing is also necessary. Besides the three or four rooms for general family life, a sleeping-room is needed for every member or every two members of the family. It is difficult to keep healthful conditions when more than two persons use the same sleeping-room.

Convenient Homes. — In cities and towns many modern conveniences are now considered necessary. The house must be lighted by gas or electricity. The gas-range must take the place of, or supplement, the kitchen-range. Running hot and cold water are available all over the house. The speaking tubes and electric bells save many steps for the housekeeper. Laundry-tubs and basins as well as a complete drainage system lighten much of the work. The house is kept comfortably warm both day and night, and is furnished with a continuous and abundant supply of fresh air. The telephone makes it possible to call the butcher, the grocer, the laundry-man, or any other tradesman without leaving the house.

Dangers of the Modern Home. — The up-to-date dwelling equipped with gas, water, drains, and heat must be kept in repair. Otherwise, these very conveniences may serve only as a menace to health. Escaping



A Healthful Home where Sunshine and Fresh Air are Abundant

gas, dripping water, open drains, coal gas, and foul air have injured the health of many unsuspecting persons. Because a leak is unnoticed and unrepaired is no proof that it will do no harm.

The Beautiful Home. — We have come to recognize that attractive and beautiful homes make for health. The green lawn, the flowering shrubs, and the beautiful garden form the most natural setting for a home. Trees planted along the street or at some distance from the

house lessen the intense heat of summer. From the first, a generous plan should be made for the finishing, decorating, and furnishing of the home. When additions are needed, from time to time, they should be in harmony with this plan. All the members of the family should take a pride in making the home attractive and beautiful as well as hygienic.

Importance of the Home. — The home is the essential feature of all civilized life. It has the greatest influence upon the lives of people. Neither the school nor the church, great as their influence is, can compare with the results of the home life. They can only modify or change the character already formed at home.

Responsibility in the Home. — The life of the family as a whole is of the greatest importance to the growth and happiness of every member. Each one should feel a responsibility in helping to make the family life wholesome and happy. Girls and boys should be cheerful and helpful. They should take pride in helping to care for the home, or in doing errands for one another. They should keep their own things in order, and should put away games and books after using them.

The Well-Regulated Home. — Good family habits are just as necessary as good personal habits. A regular time for rising, for eating, for working, for recreation, and for retiring, all help in making the family life well-ordered, regular, and hygienic. Promptness is a great help in the home. Each day brings its own work and each season its own duties. The family life, games, sports, and pleasures are an education to the different individuals.

The Use of the Home. — For many centuries homes have sheltered and protected parents and their children. In civilized lands they have done more than this. The home is the place for growth and development. The change in life to better and better things should be reflected in the home. As old thoughts are outgrown



THE WELL-KEPT HOUSE OF A LABORING MAN

for new, so the old home should be replenished to reflect the new growth. But the home is more than a shelter. It is the place of peace and rest. It is the place where we renew, daily, our strength and inspiration.

Living Together. — Courtesy and forbearance make living together in the family a source of happiness. The happy home "is cheer, is peace, is trust, is delight; it is all these for, and all these in, each other. The little festivals of love are kept, but, after all, the best days are the every-days." Longfellow has expressed a similar thought, "Home-keeping hearts are happiest."

Municipal Housekeeping. — As people live together in families, so families live together in villages, towns, and cities. Many problems of living must be solved by the community as a whole wherever a large number of people live together. A safe water-supply and sewage system are the chief essentials. Sufficient police and fire protection are also necessary. Dignified and well-cared-for public buildings, including schoolhouses, libraries, court-houses, and theatres are imperative. City streets and parks must be laid out, lighted, and maintained in good order.

Health Laws. — Health regulations in regard to food, air, water, wastes, and many other matters protect the people. Pure food, air, and water must be regulated or controlled by city, state, or national authority to make them possible for every one. A good government makes it easier to obtain the passing and the enforcement of health laws and regulations.

Summary. — 1. Good health is of first importance.

2. We are able to regulate for ourselves many questions of personal hygiene.

3. The family, together, must solve many problems of right living.

4. A hygienic, well-regulated home is a great help in keeping well.

5. Conveniences in the home have become necessary so that we may have time for recreation and growth.

6. The most helpful home will be beautiful as well as wholesome.

Questions. — 1. What are some of the qualifications of an efficient worker?

2. What are the essentials of a hygienic home?

3. What are some of the conveniences found in modern dwellings?

4. Are there any dangers in these conveniences? What are they?

5. What helps to make the home beautiful?

II. THE DWELLING HOUSE

This house I've built for me and mine;
May it be of peace a shrine;
And may no enmity or sin
Ever find its way therein.

Old English Motto.

Choosing a Home. — Boys and girls usually have little choice in the location of their homes. Often, in the country, they live where one of their parents was born and perhaps their grandparents before them. Many of the old homesteads have been handed down in the same family from generation to generation. In towns and cities, homes are less permanent. Some families, it is true, own their own houses, and are permanently located. More families hire houses or apartments, and never become attached to them. If they see another house with more modern improvements, or for lower rent, they are ready to move at short notice. In selecting a home, there are many problems to be considered.

Living in the City. — Many persons enjoy living in a large city. Usually they can find homes near the public schools, and not far from the churches of their choice. Lectures, concerts, and theatres are near at hand. To some, the brilliantly lighted stores and the crowds of people offer a continuous source of amusement. Here are found many modern conveniences, as gas, water, drainage, and electricity. All these lighten work and

save time, so that more pleasure and enjoyment are possible. But the city has also its disadvantages. It is noisy, and it is dusty. It lacks the pure air and the bright sunshine of the open country. Thousands of little children have no other place to play out-of-doors than the sidewalk and the dirty streets. In summer, how hot and close it is!

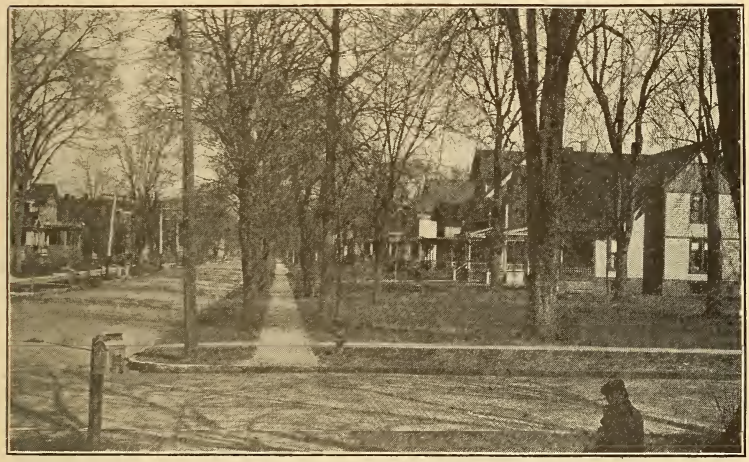
Living in the Country. — The great advantage of living in the country is the abundance of fresh air and sunshine. How much children enjoy the birds, the hens, the dog, the puppies, the cat, the cow, and the horse. There is not room in the city for pets. Then, too, all the good things to eat grow on the farm. We enjoy apples and peaches and plums in the city, but think of watching them grow and helping to gather them! There are other pleasures too. Riding, swimming, swinging, visiting, and picnicking are dear to the heart of every boy and girl.

These are things I prize
And hold of dearest worth:
Light of the sapphire skies,
Peace of the silent hills,
Shelter of forests, comfort of the grass,
Music of birds, murmur of little rills,
Shadow of clouds that swiftly pass,
And, after showers,
The smell of flowers
And of the good brown earth, —
And, best of all, along the way,
Friendship and mirth.[1]

Henry Van Dyke.

[1] From "Music and Other Poems," copyright, 1904, by Charles Scribner's Sons. Used by permission.

Are there disadvantages in living in the country? Sometimes it seems a long distance to the store, the school, the church, or the post-office, but now the rural free delivery of mails and the telephone have helped to bring friends nearer together.



Suburban Homes

Living in the Suburbs. — Many prefer to live in the suburbs of a city. Here they obtain the advantages of both city and country life. Schools, churches, and stores are convenient, and it is easy to find pleasure in the city. The chief objection is the loss of time in going back and forth to the city. There is plenty of air in the open spaces, and small gardens are possible.

A Good Neighborhood. — Although we may not know all of our neighbors, it is well to live in a good neighborhood. It is pleasant to live with quiet, law-abiding families. The absence of active business, of the dust

and the noise of manufacturing plants, of saloons, and of low marshy ground is always desirable. Then we must each do our part to keep our yards, steps, and sidewalks neat and clean. This is as important as a clean house.

Selecting the Location. — After the family has decided upon a desirable locality, and decided whether to buy, build, or rent, it is necessary to look for the house. So let us, together, go house-hunting.

Variety of Dwellings. — As we walk up and down the streets, what a great variety of houses we find. There are dwellings to meet every need, from apartments of two, three, or four rooms to stately residences of fifty rooms. In style of building, they range from the simple box-like house to the imposing colonial dwelling. So the rents vary, too, from $150 a year to $15,000. Let us examine some of these houses.

The Beautiful Residence. — Wealthy men have built very beautiful residences in America. In New York, Chicago, Philadelphia, St. Louis, Boston, Cleveland, and other large cities, their town houses are palatial. Within, nothing is too good for decorating and furnishing. Rooms are finished in marble and in mahogany, and the walls are hung with wonderful tapestries. Sometimes, an entire room is finished in wood that once decorated a palace of the old country. Wonderful fireplaces reach to the ceilings, and are copies of those in some ancient palace of Europe. Furniture, draperies, and carpets are collected from the four quarters of the earth, and no expense is spared.

A Country House. — Some of the fine estates that have been created in this country are similar to the old English places that have descended for generations from father to son. A large, rambling house is often set upon a commanding hill. From the wide verandas,



A Pleasant Cottage Home

fine views may be obtained of the rolling lawn, the stately trees, the beautiful garden, or the distant river or hills.

The Single House. — Perhaps the most comfortable dwelling for a family of moderate means is the single one-family house. In the city, it may be one of a block of houses; a little square in front and another at the rear is the most that it can claim for a yard. In the suburbs, the single houses are found on the pleasantest streets, often shaded with trees. A good lawn in front and possibly a little garden at the rear may add to the

attractiveness of the place. In towns and villages, most of the houses are surrounded by a small piece of land developed as a lawn, a flower, or a vegetable garden. Here there is plenty of room for tennis, croquet, and other out-of-door games.

Cottages. — The small single house is often called a cottage. Some of them cost only a few hundred dollars and are very simple. In the less expensive suburbs of any large city are found cottages which are attractive homes. In connection with a cottage, we always think of a flower garden or a tiny vegetable garden. The cottage homes of England are more picturesque than many of our own country.

Apartment Houses. — In the large cities and in their adjoining suburbs, many of the more moderate rents are found in apartment houses, built for two, three, or more families. Some of these buildings offer janitor service and are up-to-date in every respect. Many of the two-family houses are attractive, have separate entrances, and are very desirable. Some of them can hardly be distinguished on the exterior from single houses. The grounds are well laid out and are usually well kept. The main objection to apartment houses is the inability to obtain quiet and privacy at all times. The noise from callers, children, or pianos may be very disturbing. Most of the large houses have no yards, and provide no place for children to play.

The Apartment Hotel. — We may call a very large apartment house with suites for twenty-five or more families an apartment hotel. In the more expensive

buildings there are elevators, offices, public parlors, and dining-rooms similar to those of a regular hotel. In the less expensive houses each family has its own kitchen and housekeeping arrangements. These hotels are often among the best furnished in the city, and are utilized by wealthy people who enjoy some of the privacy of home life without all of the care of keeping house.

Tenements in Large Cities. — We can scarcely imagine, unless we have visited the poorer districts of a large city, how many tenements there are, or what swarms of people inhabit them. The tenement house census of 1900 states that in greater New York there are eighty-two thousand tenements and that two thirds of the people of New York City live in them. In other words, as many people live in tenements in New York City as live in the entire state of Michigan. In New York, Boston, and Cincinnati are found the most wretched crowded conditions, and the housing of the poorer people in these cities has become a serious problem. In other large cities the houses for workingmen are scattered over more space, so that enough air and sunshine, at least, can be obtained.

A Tenement House. — Some of us have visited poor tenement houses. They are very unattractive. We find them stretching block after block. While they may be three, four, or even twelve stories high, most of them are five or six stories. The steps and doorway may be dirty and uncared for. The hallway is often narrow, is usually dark and close, and there is little ventilation. There are crowds of people, and appar-

ently no room for the multitude of children. Clothes are seen out drying at all times, and the people are busy at housework or some other employment, such as making cigars or garments. We do not need to stay very long to see how the people live.

Life in a Tenement House. — "Being born and bred on the East Side of New York,[1] I am somewhat in a position to judge the various discomforts that exist in the modern tenements. The greatest evil is the lack of light and air. The air-shaft is so narrow that the kitchen windows in two houses adjoin each other. In most houses the air-shafts are the only means of light and air for at least two out of every three rooms, and the only means of lighting the staircases.

"The first thing that awakens one in the morning is the loud voices of the various tenants, intermingled with the odors that arise from the kitchen windows. It is indeed wonderful that you can distinguish any one voice among them all. If we are to give the reason for the people's loud voices, let us first consider how difficult it is for one to make himself understood in this medley and confusion; in this congested House of Babel it becomes habitual for us to raise our voices.

"After the children are sent to school, the various mothers commence their house-cleaning. Then comes the question, What is to be done with the garbage of the day? Most women solve it by throwing it into the street or the air-shaft. It is much easier than climbing

[1] The following account is written by a young woman of twenty, a tenement house dweller in New York.

the dark stairs and running the risk of breaking one's legs. In some cases it is almost a necessity to throw it out, the premium on space is so high in their tiny kitchens, which hold wash-tubs, water-sink, and chairs, and just room enough to turn about. In this room the



A Tenement House of the Better Sort

cooking, the washing of clothes, and the daily ablutions of the various members of the family take place.

"The cooking is generally abbreviated to one meal a day, the other meals consisting of tea or coffee, with bread and butter. On washing and ironing days the

children are sent to school with a cent to buy candy, instead of lunch.

"After the principal meal of the day is over, the kitchen changes its appearance into a study room; the older children sit at the table doing their arithmetic, while the younger ones sit on the floor or any available space, with a large book on their laps for a desk.

"The public schools are beginning to realize the East Side needs by opening their buildings and playgrounds for quiet study and play, which are a dire necessity; where every inch of space is utilized in their houses, it is a relief to get into a large, airy room.

"The law forbids putting pots or pans outside of windows on fire-escapes, but the rooms are not supplied with enough closets or refrigerators, hence this is the only means of getting rid of them."

Overcrowding in New York. — One of the chief evils of tenement houses is the overcrowding of many persons in a small space. Sometimes one family will take several boarders, or sublet one or more rooms to another family. A walk through one of the thickly populated streets of a large city will show what overcrowding means. Men, women, and children are everywhere, on the streets as well as in the houses. It is even worse at night, when the men and the children, some of whom are away during the day, have returned to eat and sleep. New York City has the worst housing conditions, for the tenth ward is "the most crowded spot in the world." According to the United States Census, the average number of persons to each house, in the old city, is

twenty. It had increased from sixteen persons during the ten years previous.

Dangers from Overcrowding. — The chief evil from overcrowding is the lack of light and air. The buildings are so tall, and are so close together, that light and air are shut out. In most of the buildings, only the rooms directly in front, or at the back, receive air from the outside. Many rooms in the middle of the house are dark, and receive air only from another room or from an air-shaft or court. The windows opening on the air-shafts are often closed and nailed up, because the shaft is so noisy, and contains such foul air. In fact, the dark bedroom is one of the chief evils of tenement houses. One typical block of houses in New York covered nearly two acres of land, and housed 2781 persons. Of the 1588 rooms, 441 rooms, or nearly one third of the entire number, were dark, with no ventilation to the outside except through other rooms. Six hundred and thirty-five rooms opened upon "twilight" air-shafts.

Neglect of Cleanliness. — The presence of dirt and filth, and the absence of ordinary cleanliness is another danger to health. Some of the schools, with their shower-baths, are a help to the children. The public baths also are available, and in summer thousands visit them daily.

Danger from Disease. — There is always found a large amount of sickness in tenements. This is due chiefly to lack of pure air, sunshine, and nutritious food, and to the presence of dirt. Contagious diseases, like

measles, scarlet fever, diphtheria, and tuberculosis or consumption, are likely to spread rapidly.

Danger from Fire. — Some of the worst fires have been in tenement districts. The fire-escapes are frequently used as storehouses for mattresses, beds, and chairs, in spite of fines repeatedly imposed for this offence. The fire often rushes up through the house by the staircase or air-shaft, cutting off all means of exit except by the fire-escapes, so it is very important to have the ladder fire-escapes, and to keep them clear at all times.

Need to know about Tenements. — The people who live in the poorer tenements may become unconsciously a real source of danger to the rest of the city in case a fire or an epidemic of sickness should break out among them. Any help to improve their surroundings must come from others. So it is important that we should know about them, and be ready to do what we can to help them.

Reforms. — There are public-spirited persons who are trying to improve the tenements, and in the last few years great gains have been made. This work has extended in four chief directions. First, the worst tenement houses in New York and Boston have been torn down. In Boston, 144 houses were destroyed previous to 1900. In New York, two beautiful parks, Mulberry Bend and Seward Parks, now give air and sunlight to a multitude of people where formerly the worst tenement districts stood. Second, many houses have been cleaned and repaired. The chief improve-

ment has been to let light and air into the 350,000 dark interior rooms of New York by cutting large windows through the partitions into adjoining rooms.

Other Reforms. — In the third place, the new tenement houses must be sanitary, and must be built according to the laws which have recently been passed. The houses must have proper light, air, and washing facilities. Fourth, tenement houses are now inspected to



A Crowded City District

see that cellars and halls are clean, that the plumbing is in good order, and that the houses and yards are kept in a sanitary condition. The improvements in the future will extend along these same lines.

The Children. — The saddest part is the story of the children. Many are put to work almost as soon as they are able to earn a cent. It is constant, weary work with little fun or play. Many children prefer to live on the streets to the poor places that they call

home. Some of the children are even homeless, and must earn their own living.

Help for the Children. — In the large cities, there are many societies and charities whose aim is to help these unfortunate children. In New York there are over two hundred and fifty charities to assist needy boys and girls. Among these are the industrial schools, boys' clubs, reading rooms, children's lodging houses, children's homes, children's hospitals, and dispensaries.

Summary. — 1. Those who live in the suburbs enjoy fresh air and sunshine as well as the advantages of a city.

2. In choosing a home, healthful surroundings should be considered.

3. The appearance of the outside of a house is just as important as the inside.

4. The homes of noted people should be preserved as national treasures.

5. Two thirds of the people of New York City live in tenements.

6. The dangers of overcrowding are the lack of air, light, cleanliness, and the presence of disease and fire.

7. It is better to avoid building too closely than it is to improve conditions afterwards.

Questions. — 1. What can we do to make our neighborhood more attractive?

2. Have you seen any yards or window-boxes planted and cared for by boys and girls?

3. Are there any beautiful residences in your vicinity? What helps to make them beautiful?

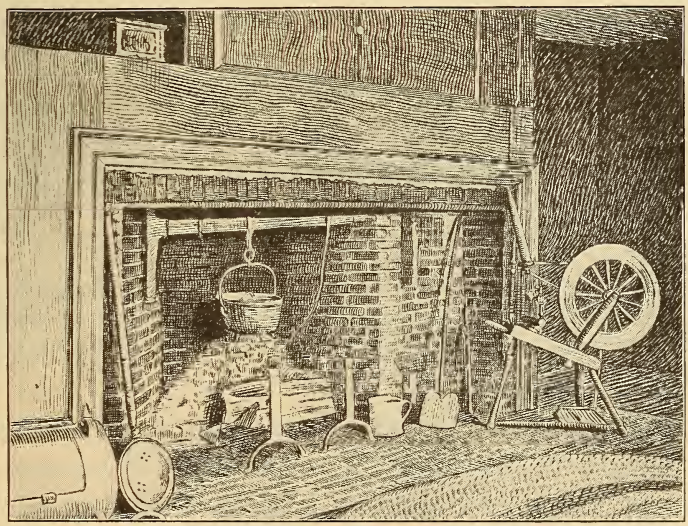
4. Have you seen a model tenement house with plenty of light and air?

5. What are good arrangements for securing pure drinking water and keeping food fresh at summer camps and cottages?

III. THE ROOMS OF THE HOUSE

As the body is to the mind,
So is the house to the body.
Old English Motto.

Houses in the Olden Times. — Houses built one hundred or even two hundred and fifty years ago are still standing. They contained few conveniences. There



A Colonial Kitchen

were no water-works except the pump, and no plumbing to worry about. There were no gas-pipes to leak, as candles supplied the light. Coal-bills and furnaces gave no trouble as all the fuel was cut on the family wood-lot, and burned in the great open fireplace.

The Twentieth Century House. — The modern house not only provides shelter, but contains many conveniences for lighting, heating, cooking, ventilating, and bathing. It should be dust-proof and sound-proof, fire-proof and vermin-proof. Especially should it be healthful and beautiful.

The Plan of the House. — In order to have a convenient house it is necessary to follow a satisfactory plan. In a single, detached house, the hall, living-room, dining-room, kitchen, and closets are usually on the first floor. On the second floor are located the bedrooms and bath-room. In the basement are the cellar and vegetable-closet. In apartment houses, one or more apartments are located on each floor. Then the living-rooms or best rooms are on the front, the bedrooms at the side, and the kitchen at the back near the drying balcony. It is desirable to have the house face the east or south, for then the sun will brighten the living-rooms while the kitchen will be cool during the busiest part of the day.

The Piazza. — A piazza, in summer, is a great convenience. It may often be made into an out-of-door living-room. Even where it is on the sunny side of the house, screens, shades, vines, and plants can do much to shut out the heat, and make a charming summer retreat. A few rugs, comfortable chairs, and a table for books add to the enjoyment of hospitality.

The Hall. — The hall is the inner gateway of the house. It should be light, cheerful, dignified, and hospitable. Glass in the front door and in the door-

way usually admits plenty of light. Sometimes the stairs are built at the back, and the front part is large enough to receive callers and to take the place of a reception-room. Sometimes a fireplace adds cheer to the large hall. Little can be said in favor of the long, narrow, and dark halls of apartment houses. Keeping



A Cheerful Living-Room

the doors that lead into them open improves them somewhat. The halls of a house should always be light and well ventilated, for the sake of the rest of the house.

The Living-Room. — If we are more than a chance caller, we shall probably be invited into the living-room to enjoy our call. This is usually the best room in the house. It is sunny and cheerful in the daytime and warm and well lighted in the evening. Here the family gather in the evenings. The father has his easy-chair,

paper, or book, and the mother her sewing. Here the children are gathered around the table for study. During part of the evening there will be games and music. Here are kept the games, the papers, the magazines, and the books of every-day use. There should be enough easy chairs of different shapes and sizes to suit the different members of the family. Here the social life of the family prevails rather than the work that should be performed before the family gather around the evening lamp. A living-room is sometimes called a sitting-room.

The Parlor. — There was usually one room of the house kept closed, and dark, and, perhaps, cold too. Here were the best chairs and the family portraits. This room was only used for marriages and other state occasions. Fortunately that kind of a parlor has gone out of favor, and the modern best-room or living-room has taken its place. It is always desirable, however, to have one room in the house that is in order to receive callers, whether that room is called a reception-room, a hall, a parlor, a sitting-room, or a living-room. In a very large and stately residence, the room set apart for receiving guests is handsomely furnished and is called the drawing-room.

The Library or Music-Room. — If there are many books in a house, it may be desirable to furnish the living-room, or some part of it, as a library. We must remember that good light and privacy are always necessary for the enjoyment of a good book. If the family is musical, the piano and music may be the key-note for de-

veloping the living-room. The interests of the different members of the family should always be considered.

The Dining-Room. — Having been duly invited to luncheon on this day, we remove our wraps and remain. How pleasant the dining-room is! It is attractive,



An Attractive Dining-Room

harmonious, and airy without having draughts. It is large enough to seat a small company comfortably. A dining-room should be dainty, and still be serviceable. If it opens directly into the kitchen, care must be taken to keep odors out of the room. A pantry where china may be kept sometimes connects the two rooms.

The Kitchen. — In many respects the kitchen is the most important room in the house. Much is accomplished here that affects the health of the entire house-

hold. Three meals are prepared and cleared away each day, and many other duties are performed necessary to the family life. The kitchen need not be large, but there should be room enough for the sink, the stoves, and the household implements. An ice-chest or re-

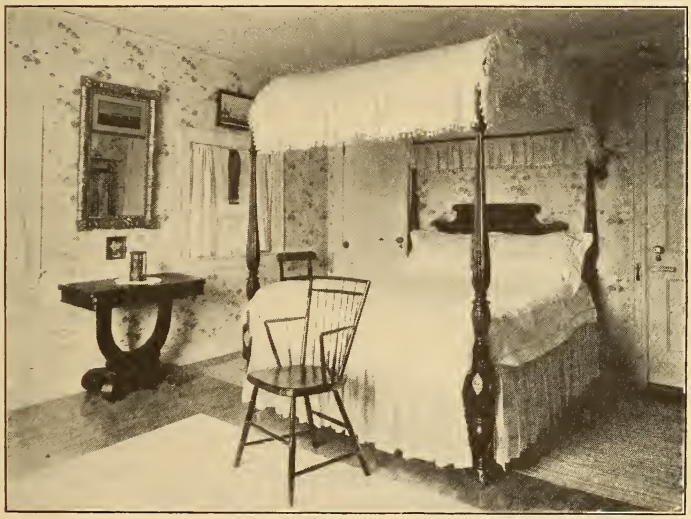


A Convenient Kitchen

frigerator should stand nearby in a pantry, vestibule, or hall. It should also be near an outside entrance for convenience in placing the ice. The prime requisites of a kitchen are cleanliness, neatness, and order.

The Kitchenette.—The kitchenette is found in small apartments. In most cases it is no larger than our grandmother's pantry. A kitchenette usually contains a small gas-stove, a small sink, and a number of shelves to hold the food. Here cleanliness and order are still more imperative than in a large room.

The Bedroom. — If we have been invited to stay over night with our friends, we shall enjoy the bedrooms. These are usually located, in a single house, on the second floor, for there they are airy, light, and farther away from the damp ground during the winter. Plenty



A Colonial Bedroom

of fresh air is of the first importance in a bedroom. It should also have sunlight during some part of the day. The bedroom should contain only the necessary furnishings, and should be kept free from knickknacks, thick draperies, and a large number of small pictures, cards, and ornaments. It should be easily cleaned, and aired thoroughly two or three hours each day.

The Bathroom. — Usually on the same floor with the bedrooms is the bathroom. This may be a small room,

but certainly should have a window opening to the outside. It will be easy then to keep it fresh and clean. Except in the coldest weather, the window should be open a few inches all of the time to insure good ventilation. The bathroom fittings are permanent, but they should be so placed that it is posssible to reach and clean all parts of the room and floor. The tub is the most important feature. It may be of enameled iron or porcelain. An old zinc tub may be improved by applying several coats of white enamel paint. There should be individual racks and shelf spaces for each member of the family to keep his toothbrush and soap, unless he carries these to and from his own room. These places should be properly labeled. It is essential that the bathroom be comfortably heated in the coldest weather, and that there is enough hot water for the use of all the family.

The Play-Room. — This is the one room in the house that belongs entirely to the children. If they are small, it may also serve as a nursery. When the children are older, the nursery becomes a workshop, a dark room, or a gymnasium. It is fitted with suitable furniture that will wear, and contains the toys, the books, the work-benches, and other precious possessions. It is just the place for rainy days and holidays.

Closets. — Of what use is a house without closets? Certainly they are needed in nearly every room. A closet off the front hall is the most convenient place for the various members of the family to leave their wraps. The china-closet in the dining-room is as indispensable as the kitchen-closet. A large well-lighted

closet in each chamber is indeed a luxury. Its rows of hooks, its chest of drawers, and its shelves above the hooks are a great help in keeping clothing neat and well-aired. If there is no window in the closet, the door should be left open when the room is being aired. Near the chambers a broom closet is a great convenience, where brooms, carpet-sweeper, and mops may be put away in an orderly manner. The linen-closet off the upper hall for the extra bedding is also a comfort.

The Cellar. — In the city the cellar usually extends under the entire house, while in the country the cellars under some of the large, old, rambling houses are very small. Formerly they were used almost wholly for keeping and storing food. Now they are used almost entirely for the heating apparatus and for storing fuel. Sometimes a small part is partitioned off as a cold closet for keeping a few vegetables and preserves. A cellar should be dry and well-ventilated. To keep out the moisture, the floor should be of concrete for six or eight inches covered with a layer of cement. The walls should be whitened. The heating apparatus, whether furnace, heater, or boiler, is the chief object in the cellar. Nearby in bins, partitioned off from the rest of the cellar, are the winter's coal and wood. The ashes may be kept in metal barrels in the cellar and should be removed as often as once a week. If more than one family lives in a house, the cellar should be partitioned off into as many rooms as there are furnaces or heaters. Ventilating the cellar is often neglected. Stout iron

netting and wire screens over the windows will keep out flies and cats. One window should be kept partly open throughout the year except during the coldest weather. If the windows are hung from the top, they may be easily raised or lowered by a cord running over a pulley.

The Store-Room. — In one part of the cellar, as far as possible from the furnace and near a window, a small room or closet may be built for vegetables. Here the preserves, the apples, the potatoes, and other vegetables can be safely stored. By regulating the window, the closet may be kept cold and at a proper temperature.

The Laundry. — The cellar is often a most convenient site for a good laundry. It should be supplied with stationary tubs and be well-lighted and heated. This is a luxury found in single houses, and helps to make the kitchen ideal by keeping the "wash-day" activities downstairs.

Summary. — 1. A suitable and convenient plan is a great help towards the success of a house.

2. People are only beginning to learn how to enjoy their piazzas by making them into summer living-rooms.

3. The living-room is the heart of the home.

4. The dining-room stands for service and good cheer.

5. Bedrooms need all the fresh air possible.

Questions. — 1. What are the conveniences desirable in a twentieth century house?

2. What furnishings are really necessary in the living-room?

3. How can girls and boys help to keep it neat and orderly?

4. Where are the best places for plants in a house? Why?

5. What care do house plants need in cold weather?

6. What are the advantages of a balcony, a piazza, a veranda, and a pergola?

IV. HOW TO VENTILATE THE HOUSE

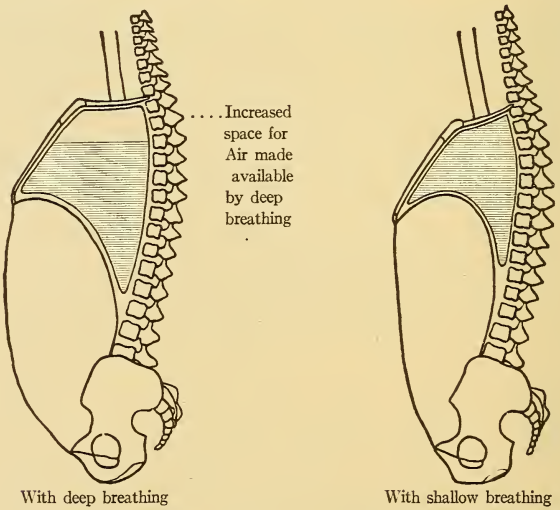
Sunny be the day,
Sunny thy spirit.
Old English Motto.

Sunshine and Health. — We often fail to realize how much we depend upon sunshine for health and good cheer. Let it rain for two or three days, and we long to see the sun again. Still we must learn not to allow the weather to affect our cheerfulness.

"Whatever the weather may be," says he,
"Whatever the weather may be,
It's the song ye sing, and the smiles ye wear
That's a-making the sun shine everywhere."
James Whitcomb Riley.

House Diseases. — In early days when people lived out-of-doors most of the time, there were fewer diseases than today. Staying in-doors all of the time in cold weather is without doubt very comfortable, but going back and forth to school and playing out-of-doors in the fresh air is much better for us. Breathing the same air over and over again until it is charged with poisons from our bodies is especially harmful. We are not able to live and keep well in close impure air, and as a result, may be attacked by colds, consumption, pneumonia, bronchitis, pleurisy, or catarrh. These are sometimes called house diseases, because the persons who stay in the house most of the time are very liable to have them.

Deep Breathing. — In order to obtain plenty of fresh air and to free our lungs of poisonous gases, we should form the habit of taking deep breaths. Deep breathing sends the pure blood to the brain, and helps us to learn our lessons quickly and well. Deep breathing aids in the digestion of our food, and prevents dyspepsia.



Diagrammatic Section of the Body

Showing the lungs fully expanded with a deep breath and partly expanded by a shallow breath

Food for our bodies is like coal for the stove. Just as coal must have air to make it burn, we must have air to change our food so that it will nourish the body. Deep breathing purifies the blood. The chief use of the blood is to carry nutrition to all parts of the body and to take away the impurities. When the blood is rich in oxygen it carries more nutrition to the various

parts of the body. Consequently we feel much better and stronger, and are less likely to be ill. Our lungs are nature's blood-purifiers. Deep breathing hastens the circulation of the blood, so that more blood is carried all through the body to repair waste and make us stronger.

Shallow Breathing. — If deep breathing is beneficial to us, then shallow breathing must be injurious. The poisonous gases remain in the blood, and are slowly but continuously carried to all parts of the body. Sometimes we look a long time for the causes of headaches, sore throats, or worse troubles, before we think of taking plenty of fresh air. Going out-of-doors and breathing deeply is a preventive as well as a cure for many ailments. A lack of good circulation of blood to the brain is often responsible for feeling dull and having the "blues." Try taking a good brisk walk the next time that you feel cross or out-of-sorts.

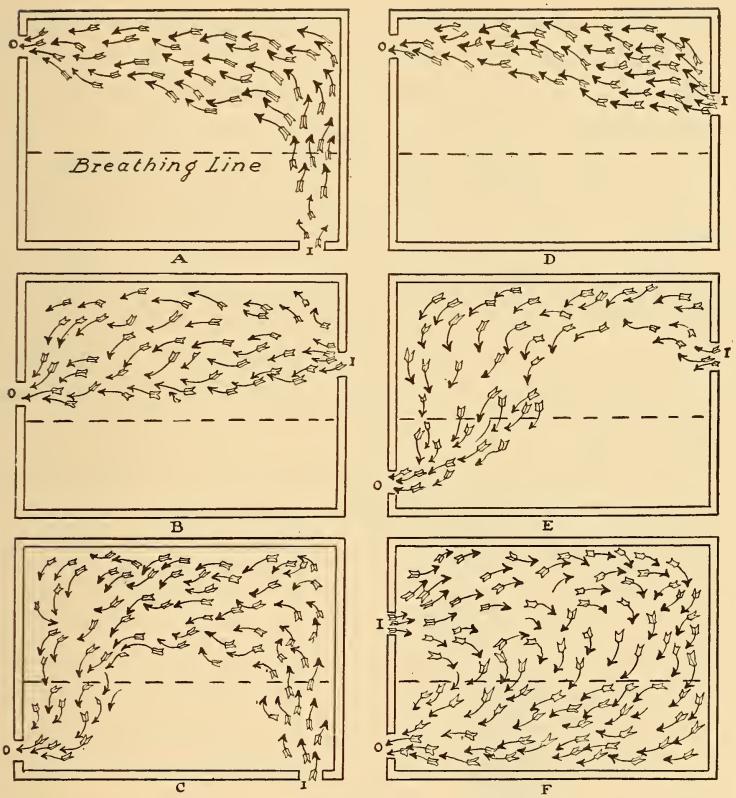
Ventilating the House. — Since we are in the house so much of the time, ventilating our lungs means ventilating our homes, schools, and public buildings. It is easy to calculate how much fresh air each person must have. One cubic foot of air is necessary each second, for each person in a room. This means that fresh air must be constantly coming into a room, and impure air as constantly going out. To avoid breathing the same air over and over again, the air in a living-room should be entirely changed four times every hour. The temperature of a room is also important. In the living-room sixty-eight or seventy

degrees, and in the bedroom sixty-six degrees or less, is warm enough during the daytime.

Principles of Ventilation. — The theory of ventilation is very simple, but to ventilate a house or building successfully is extremely difficult, and rarely accomplished to everybody's satisfaction. There are three requirements: first, to provide plenty of pure air; second, to avoid draughts, either hot or cold; and third, to provide means of escape for the foul air. It must also be remembered that when air is breathed out it is moist and warm and therefore expands, becomes lighter, and rises. The cold air rushes in to take the place of the ascending air. As the impure warm air cools, it becomes heavier and sinks to the floor.

Inlets and Outlets. — In order to have a regular plan for ventilation, each room must have a place arranged for the pure air to enter, called an inlet. The opening may be a window, a door, or a register. Each room must also have a means of escape for the foul air, called an outlet. The outlet may be a register, a stairway, or a fireplace. The size and the location of the inlets and outlets are very important, and may make all the difference between good and poor ventilation. Their arrangement in houses is somewhat different from that in large buildings like schoolhouses, theaters, and churches.

Arrangements of Openings. — The inlets and outlets may be arranged near the floor or the ceiling. The diagram shows the result of ventilation with different positions of the inlet and the outlet. The curved lines indicate the current of air circulating in the room. In *A*,



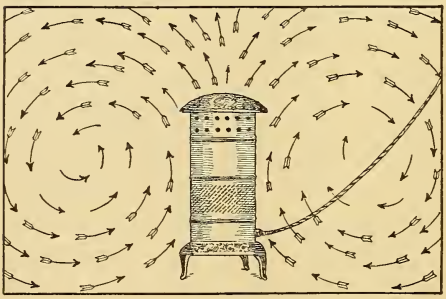
DIFFERENT ARRANGEMENTS OF OPENINGS FOR HEATING AND VENTILATING

the square represents a section through a room. The pure air is supposed to enter through a register at *I*, rise to the ceiling, and be drawn out through the outlet, at *O*, near the ceiling. The dotted line, called the "breathing line," represents the level of the head of a person sitting in the room. With this arrangement of inlet and outlet, half of the room remains unventilated.

In *C*, the inlet is on the floor and the outlet also near the floor, but on the opposite side of the room. Is there any portion of the roon not ventilated by this arrangement? Can you explain *B*, *D*, and *E?*

The Best Arrangement. — The best ventilation is obtained when the air circulates throughout every part of the room, as represented in *F*. The air enters the upper part of one wall, at *I*, strikes against the opposite wall, falls to the floor where it is drawn off through an outlet, *O*, near the base of the same wall. A fireplace or opening into a flue in the chimney would draw off the foul air.

Ventilation in Summer. — During five or six months of the year, according to the locality, the weather is so mild that our windows and doors are open, and the ventilation takes care of itself. But in winter the ventilation must depend upon the method of heating, the possibilities of ventilating, and upon ourselves.

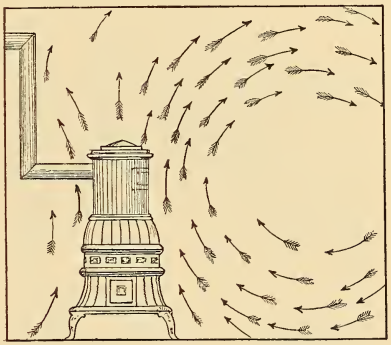


Circulation of Air with a Gas-Heater

Circulation of Air with a Gas or Oil Heater. — With the first cold weather some people use a gas or an oil heater for warming one or two rooms. This is almost certain to make the air of a room unfit for breathing. The figure above represents the circu-

lation of air in such a room. When the window is closed, as it usually is, to keep out the cold air, the same air is breathed and heated over and over again until the upper part of the room becomes unbearable. Conditions are improved by opening the window.

The Gas-Log. — The gas-log is another enemy of fresh air. It sucks up cold air from the floor and heats it so that it rises and spreads out over the room. As it cools, the foul air falls to the floor, only to be caught again in the vicious circle. Any large opening, if near the gas-log, serves as an inlet rather than an outlet of air. The gas-log calls for heroic ventilation through the window.



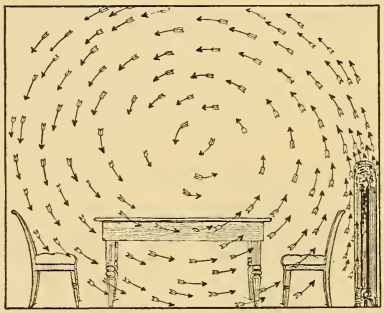
Circulation of Air with a Stove

Ventilation with Stoves. — There are still many rooms heated with stoves. From your own experience and from this figure, perhaps you can tell how the air circulates in the room represented. A small opening at the top of the window is *always* needed for fresh air, even if it is cold air.

Ventilation and Hot Air Heating. — When heating with hot air, the problem of ventilation is half solved. Pure air is heated, and driven into the rooms; but where does it go after it becomes foul? It may be sucked into another room, or up or down a stairway. Possibly

there is a fireplace which will draw it up the chimney, or perhaps there is an opening into a ventilating flue or shaft.

Circulation of Air from Radiators. — When heating with hot water or steam, heat comes from the radiator and no fresh air is admitted through the heating apparatus. Air is sucked up from the floor and heated over and over again. Fresh air, even if cold, must be admitted by way of the windows if no other means of ventilation is provided. (See the figure.)



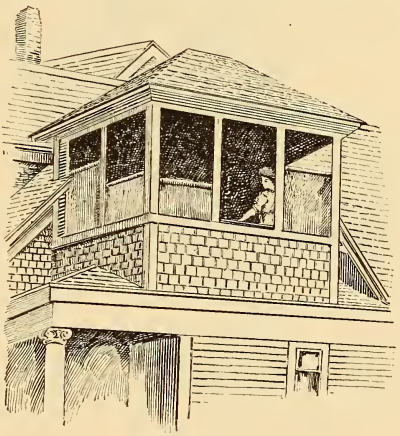
Circulation of Air from a Radiator

Ventilating Shafts. — The fireplace and its opening or flue offer the best way of withdrawing foul air from a living-room or bedroom. In many instances its use for ventilation and decoration are its only excuses for being used so extensively. A ventilating shaft may be built in any partition, where a fireplace would be impossible. A shaft is only a very long, narrow, wooden box, and may be built from the first floor to the roof. A register in the baseboard of the room opens into the shaft, and provides for the exit of impure air.

Systems of House Ventilation. — Most small houses and most apartment houses are without any system of ventilation. The builders are far more anxious to heat

than to ventilate such houses. The doors and windows must do the work of ventilation. Houses of the better class are being equipped with some system of ventilating as well as of heating. Arrangements are made for drawing off the foul air as well as for admitting warm, fresh air.

Value of Living Out-of-doors. — People are just beginning to realize the value of living out-of-doors. Piazzas and balconies on houses and apartments, trolley and steamboat riding, public baths and parks, open air schoolrooms and camps, all testify to the universal desire to be out-of-doors in the summer.



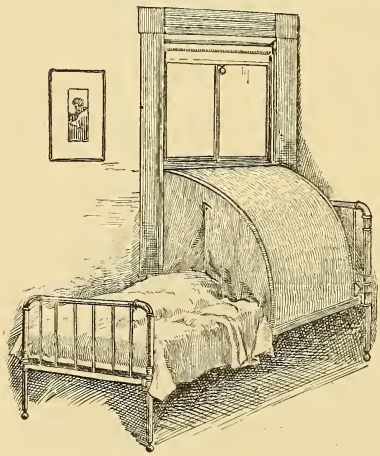
A Sleeping Porch

Sleeping Out-of-doors. — The well and the sick are not satisfied with being indoors even at night. Many are sleeping out-of-doors. Careful arrangements should be made for protection from the ground, the rain, the winds, and the cold.

A Sleeping-Porch. — A balcony or a piazza, especially if it opens out of a bedroom, is an ideal place for sleeping. Many balconies are being built for this special purpose. The balcony should have screens or awnings and very little furniture, possibly only the bed. Plenty

of warm clothing and a hood for the head are necessary in cold weather. All clothing is kept in the bedroom which serves as a dressing-room.

The Window-Tent. — When a porch is not available, it is still possible to have the head out-of-doors. Sometimes the head of the bed is merely slipped out of the open window for one or two feet; and the person then sleeps in the open. A window-tent accomplishes the same result. The bed is placed along the wall of the bedroom with its head in front of the window, and the canvas cover of the tent is arranged across the head of the bed as in the accompanying picture. When the window is open, the head of the person is practically out-of-doors. With any of these arrangements abundant protection from the cold is necessary.



A Window-Tent

Summary. — 1. Those who are out-of-doors most of the time are less liable to have certain diseases, like consumption, pneumonia, bronchitis, and colds, than those who stay in the house all of the time.

2. Ventilating every room of a house thoroughly every morning helps to keep the air pure.

3. Good ventilation depends upon providing plenty of pure air, avoiding draughts, and providing means of escape for the foul air.

4. Both an inlet and an outlet are necessary for a circulation of the air.

5. The benefits of sleeping out-of-doors are increased vitality and strength for the sick or well.

Questions. — 1. What is the difference between deep and shallow breathing?

2. How do you ventilate your bedroom at night? During the day?

3. Make a drawing showing the ventilation of your schoolroom.

4. Is there a ventilating shaft? Study the direction of the air.

5. Did you ever keep a record of the temperature of the schoolroom? Some pupils might be appointed to note the temperature and record it on the blackboard every hour during the day.

6. What is the proper temperature for living-rooms?

V. HOW TO WARM THE HOUSE

When the logs are burning free,
Then the fire is full of glee:
When each heart gives out its best,
Then the talk is full of zest:
Light your fire and never fear,
Life was made for love and cheer.[1]

Henry Van Dyke.

The Ideal Warmth. — Some persons give little thought to the best way of warming their homes. When we step into their houses, the rooms seem damp, chilly, and cold. When we go into other houses, the air is so hot and dry that it seems to strike against the face. Such houses are poorly heated, and are unhealthful to live in. When we step into a perfectly heated house, it should be like stepping from winter to summer. The air should be mild, balmy, warm, and free from all unpleasant odors. Draughts of pure or foul air should both be absent. The house should be so comfortable that we are unconscious of any heating or ventilating.

Loss of Heat from the House. — Heating must be continuous in winter in order to make a house comfortable. Heat escapes from a house in many ways. Some heat passes directly through the walls, although they may look solid enough. Some heat goes up the foul air passages or fireplaces. Much cold air comes in around windows, doors, and vestibules. In a bleak,

[1] Copyright, 1904, by Charles Scribner's Sons. Used by permission.

exposed position, a house is harder to heat than in a sheltered location. The rooms on the north side of a house are usually colder, and are heated with more difficulty than those on the south side. A room often seems much warmer than it actually is, when the bright sunshine is streaming in at the windows.

Requirements of a Heating Plant. — The heating plant of a house is unsatisfactory unless it will heat the house comfortably even in the coldest weather. It must also have some device for regulating the amount of heat in mild weather. It must be comparatively simple in construction and durable, so that frequent and expensive repairs will not be necessary. Since it is usually run by some member of the family, the heater should be simple to work, for often it is neglected in the rush of other duties. It should also be economical in fuel, and be protected against loss of heat. At best, the cost of coal is a heavy item in household accounts.

Heating by Gas. — Illuminating gas is seldom used alone for heating a house in very cold weather. In the spring and fall, some persons find it convenient and economical to heat one or two rooms in this way. It may be used either in a gas-log or a gas-heater. The latter has the advantage of being portable, and may be connected with rubber tubing to any burner. This is a quick way of heating a single room, as a dining-room or a bathroom. Burning gas always makes the air impure, and care should be taken that all of the connections are tight, and that no gas escapes into the room. This is an expensive way of warming a room.

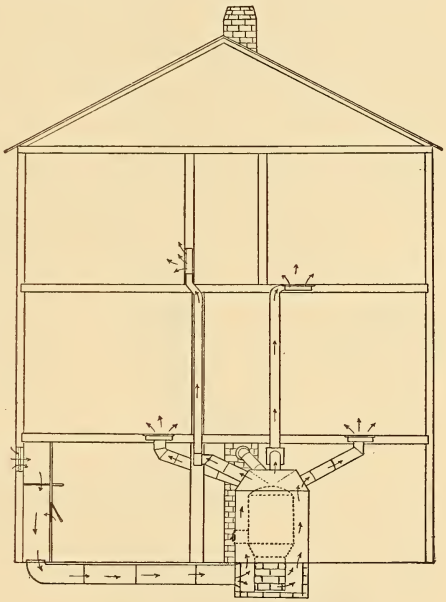
Heating by Oil. — Oil is sometimes used in a heater resembling a gas-heater, but is seldom depended upon for very cold weather. The oil-heater is also portable, but makes the air of a room very foul. A window should always be open when a heater is burning in a room. The gas and oil-heaters are both easily controlled, and there is no waste of fuel, but they are both great destroyers of pure air, and must be watched carefully to prevent accidents.

Heating by Stoves. — While stoves for heating dwellings have gone largely out of use in most city houses, they may still be found in some of the older apartments and stores. In many rural districts they are still in general use. A house may be heated comfortably with stoves, but some arrangement should be made for letting in pure air, and for drawing out foul air without draughts.

Disadvantages of Using Stoves. — There are many disadvantages in heating a house with stoves. First, it is hard work to care for two or three stoves. Coal must be carried up stairs, and the ashes carried down. The stove must be kept blacked, and the floor under and around it kept clean. A stove makes a great amount of dust in the room, so that it has to be swept and dusted very often. Many people take their stoves down in the summer, and put them up again in the fall. All this makes extra work. Unless the room is carefully ventilated, the air is heated over and over again, so that it seems like "burnt air." Stoves furnish a very dry heat, and it is customary to have a dish of water on the

top of the stove to supply moisture to the air. It is no wonder that stoves have been discarded whenever possible in favor of a heating apparatus located in the cellar.

Heating with a Furnace. — Probably more city dwellings are heated by hot-air furnaces than in any other way. If your house is heated in this way, you can examine the pipes in the cellar, and can see exactly how the heating is done. The entire system consists of a cold-air box, a furnace, a smoke-pipe, warm-air pipes, and registers. The diagram shows the general arrangement of the different parts in a single house.



HEATING WITH A FURNACE

The Cold-Air Box. — Cold air is taken to the furnace, heated, and then rises to all the rooms of the house. The cold-air box is the long wooden or metal box in the cellar which carries the cold air to the furnace. The outer opening is in one of the basement windows, and should be covered with iron netting to keep out cats and waste paper. The inner end opens into the base

of the air-chamber of the furnace at the side or the back. There is a slide or damper in the cold-air box to regulate the amount of air admitted.

The Furnace. — The furnace should stand near the center of the cellar, so that the heat may reach all of the rooms of the house. The furnace is double, and like two cylinders, one inside of the other, but entirely separate. The cold-air box opens into the outer cylin-

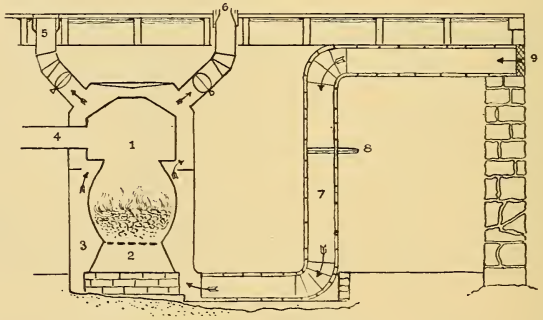
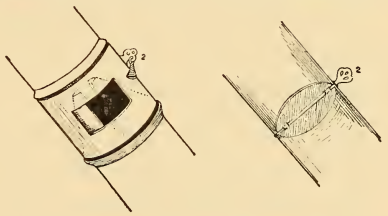


Diagram of a Furnace

der, called the air-chamber, because it contains air only. Here the air is heated by the inner cylinder, and rises into the pipes that open out of the top of the air-chamber. The inner cylinder contains the fire. The upper part is the fire-box, which is separated by the grate from the ash-pit beneath, which holds the ashes. The fire-box should be perfectly tight around the sides. If there are any cracks the coal gas, which is very poisonous, and the ashes will escape into the air-chamber, and thence go up into the rooms. When you look at the outside of your furnace, you see the outside of the air-

chamber. When you look inside your furnace, you see the inside of the fire-box or ash-pit. If you rap on the outside of the furnace, it sounds hollow, showing that there is a vacant space within. There is usually a water-pan in the air-chamber with an opening through the outer wall of the chamber. This is to furnish moisture to the air.

The Smoke-Pipe. — Opening out of the back of the fire-box is a pipe connecting with a flue in the chimney, to carry off the smoke and the gases of the burning coal. This pipe is fitted with a damper for regulating the draught.



Smoke-Pipe and Damper

The Hot-Air Pipes. — From the upper part of the air-chamber, tin pipes extend to all of the rooms of the house. Those to the first floor open directly into registers in the floor. The pipes to the rooms on the second and third floors pass up in the partitions to their corresponding floors, and open into registers. The register can be closed, or a damper in the pipe in the cellar turned, when it is necessary to shut off the heat from any room. Sometimes the hot-air pipes are double, or are wrapped in asbestos paper to save the heat.

The Care of a Furnace. — The work that a furnace can do depends largely upon the way in which it is run. If well run, a house should be continuously supplied with fresh, warm air. Less cold air should be admitted

in very cold and windy weather than on mild days. Occasionally — once a year — the cold-air box should be dusted out, so that dust will not be carried up into the rooms. This part of house-cleaning is usually neglected. A slow, steady, deep fire is the most economical in burning fuel. A small fire is more easily kept with small coal than with furnace coal. The ashes should be removed daily, and the pit kept clear to obtain a good draught, and to prevent burning out the grate.

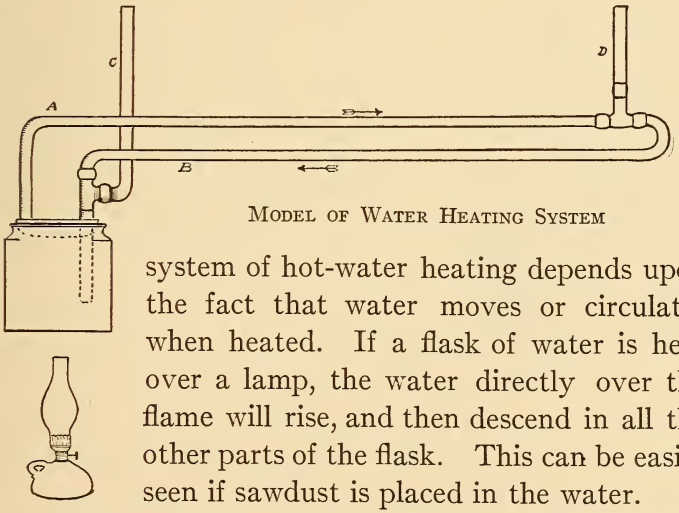
The Advantage of Heating with a Furnace. — Better ventilation may be obtained with a furnace than with hot-water or steam-heating. The first cost of setting up a furnace is less, and it requires less skill to run, than either a hot-water heater or a steam-boiler.

The Disadvantages. — There is dust from the pipes and cold-air box, — and sometimes ashes, smoke, and coal gases from the fire, if all the seams are not fitted perfectly tight. The amount of heat varies. When the fire is low, the air is cold. It is hard to heat on a very windy day. There is a limit to heating with hot air, as the air becomes cold in a very long pipe or in a horizontal pipe. Sometimes the lower rooms of a house are cold, while the heat rises to the upper stories where it is not so much needed.

Heating with Hot Water. — Under some conditions, a furnace will not heat a building successfully. Many of the newer and the better houses are heated with hot water. In this kind of a heating plant, water instead of air is heated in the cellar, and carried in pipes to the various rooms of the house.

The General Plan. — The different parts of a system for heating with hot water are a boiler in the cellar to heat the water, a smoke-pipe, and pipes extending up to every room to carry the hot water. A radiator in each room to give out heat, and return-pipes to carry the cool water back to the boiler to be heated over again are also necessary. There is also a tank of water in the attic with a pipe for an overflow.

The Circulation of Heated Water. — The entire system of hot-water heating depends upon the fact that water moves or circulates when heated. If a flask of water is held over a lamp, the water directly over the flame will rise, and then descend in all the other parts of the flask. This can be easily seen if sawdust is placed in the water.



MODEL OF WATER HEATING SYSTEM

The Model. — If possible fit up a model of a small heating plant like that shown in the figure above. The lamp represents the boiler; *A*, the supply-pipes; and *B*, the return-pipes. Heat the water in the flask, and notice the action of the water. What is the use of the filling pipe (*C*) and the expansion pipe (*D*)?

The Heater or Boiler. — To one accustomed to a furnace, the size of a hot-water heater is a great surprise. A heater will do the same work as a furnace nearly twice its size. It is made of iron, and consists of a fire-pot, a grate, and an ash-pit, similar to a furnace. The outside of the boiler is usually covered with asbestos or some other substance to prevent the heat from escaping.

The Supply-Pipes. — In the upper part of the fire-box is a coil of iron pipes filled with water, which is warmed by the fire directly beneath. A single pipe leads from this coil, through the top of the heater, to the different stories of the house. Often there are branches leading into the different parts of the house. These supply-pipes are usually placed in the corner of a room or against a wall. They are gilded or bronzed, to harmonize with the color of the walls, and help to heat the rooms through which they pass.

The Radiators. — Each room is heated directly by the coil of pipes within the radiator. The warm water passes up from the boiler through the supply-pipes, and through short branches into the radiators. Trace the path of the water in the diagram on the opposite page. Radiators are usually placed in the coldest part of the room, near a window or door, to warm any cold air that may enter.

The Return-Pipes. — Pipes similar to the supply-pipes carry the cold water back to the boiler. These are the return-pipes, and usually run parallel to the supply-pipes, but may be distinguished from them by

their temperature. Short connections run from the radiators to these pipes. The return-pipes lead to the cellar, where they enter the lower part of the boiler, and connect with the coil of pipes in the fire-box. There is usually a faucet just outside of the heater so that the water may be drawn out of the pipes. The cold water to fill the pipes is taken, when possible, from the house-supply, and the pipe may open into the return-pipe near the boiler.

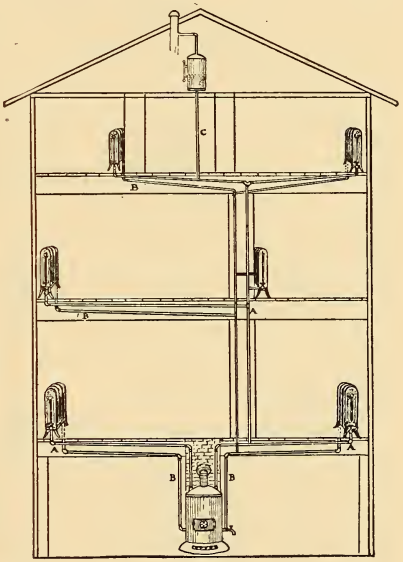


Diagram of Hot-Water Heating System

The Tank. — An iron tank containing several gallons of water is usually located in the attic or bathroom. It is connected with a ventilating pipe and an overflow pipe running, in the walls, to the bottom of the heater in the cellar. This tank is large enough to allow for the expansion of the water in the pipes when warmed, and to prevent an overflow.

Running a Heater. — The best results are obtained by keeping a steady, even fire in the heater. Too hot a fire results in the water boiling in the pipes, which is undesirable, although not dangerous. Usually the water should not go over one hundred and ninety degrees

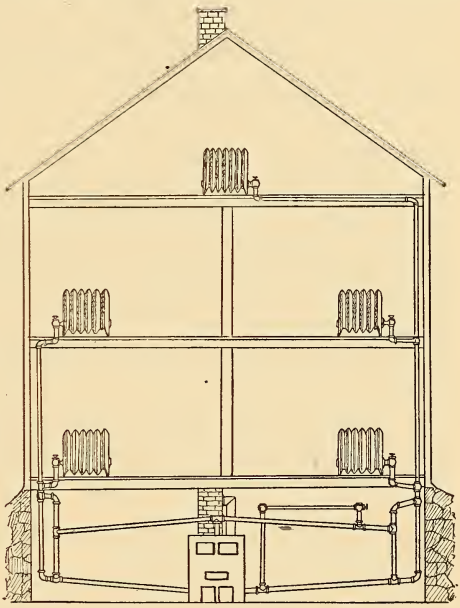
even in the coldest weather. If the fire should get very low the results are not felt so quickly as with a furnace, for the water in the pipes will keep warm for some time. The fire, however, should never be allowed to go out entirely in cold weather, for then the water would be likely to freeze and burst the pipes. In order to obtain the most heat, a good circulation should be maintained throughout the pipes. Sometimes a radiator is cold and will not heat, even with a good fire. This may be due to more or less air that has collected in the radiator, and may be remedied by opening the air-valve on the upper part of the radiator and letting out the air. Every spring after the fires are out for the season, it is best to clean out the heater, and make any necessary repairs.

The Advantages of Hot-Water Heating. — The chief advantage of heating with hot water is that a steady, even temperature may be kept all over the house. It will comfortably warm rooms that are a long distance from the cellar, or are much exposed to cold winds. It costs about one third less to operate than a furnace. Consequently it is less work to run, since there are less coal and ashes to shovel, and less tending. There is little danger of overheating, and it can be run low in mild weather. It is a very clean way of warming a house, for no dust is carried into the rooms. The plant is simple in construction, easy to run and to regulate. It is also noiseless.

The Disadvantages. — The chief objection is that there is no chance for ventilating as well as warming.

Some other arrangement must be provided for admitting fresh air. It is also more expensive than a furnace to put into a house, but this is soon offset by the reduced cost of running.

Steam-Heating.— Many large apartment houses are heated by steam. The principle of this system is the fact that when steam changes to water, or condenses, it gives off heat.



Steam-Heating System

The Pipes.— This system is similar in general to that for hot-water heating. It consists of a boiler, supply-pipes, return-pipes, and radiators. It must be stronger, however, and differs in the details of the boiler, valves, etc. The diagram shows the arrangement of pipes sometimes used.

The Advantages. — For large buildings steam is a very efficient means of warming. It may be carried long distances, and several buildings may be warmed from a central plant. It is especially useful in buildings used only during the day.

The Disadvantages of Steam-Heating. — It is expen-

sive to run. It takes more coal than a hot-water system, and requires more skill. Steam is difficult to regulate. When turned on, the rooms may be overheated, and when turned off, the rooms soon become too cold. Steam-pipes are often very noisy when the steam comes in contact with cold radiators.

Summary. — 1. It is just as injurious to have a room too warm as it is to have it too cold.

2. Houses are warmed by hot air, hot water, and steam.

3. The most important parts of a hot-water or steam-heating plant are the boiler, the supply-pipes, the radiators, and the return-pipes.

4. A house may be warmed most economically and easily with hot water.

5. Warming with hot air furnishes pure air as well as heat to the rooms.

6. Steam heat is better adapted to large office buildings, where it is not necessary to regulate the amount of heat to the different uses of the rooms.

Questions. — 1. What are the disadvantages of using gas and oil for heating?

2. How is your home heated?

3. What are the advantages of the method? The disadvantages?

4. What is the cleanest way of heating a house? Why?

5. Why does a furnace sound hollow when you rap on the outside of it?

6. Why does a furnace sometimes fail to warm a house?

VI. HOW TO LIGHT THE HOUSE

Ere you enter in this door,
Or set your foot upon the floor,
Give good luck to me and mine,
As I do to thee and thine.
Old English Motto.

Natural Lighting. — All of our light comes, originally, from the sun. On bright, sunny days the direct rays of light may shine straight into our rooms, or they may fall on objects outside of the house, and so be reflected through the windows. Any strong reflection or glare, as it is sometimes called, is very injurious to the eyes, and we should pull down the window-shades to avoid it. We should never sit facing a bright light of any kind. On cloudy days all light is reflected from the sky, the clouds, and bright objects about us.

A Well-Lighted Room. — The satisfactory lighting of a room depends upon several things. The surroundings of the house are very important. A broad street and open spaces between the houses will admit much light. Trees, broad piazzas, low roofs, or eaves will cut off the light. The number and position of the windows determine largely the amount of light admitted. The windows on the sunny side make a house more cheerful than those on the north side. The window-shades and draperies may keep out light that is much needed, or they may only subdue a strong light. The color of the walls, floor, and furniture also help to make

a room light or dark. Light colored furnishings reflect the light and make a room appear lighter, while dark furnishings absorb part of the light.

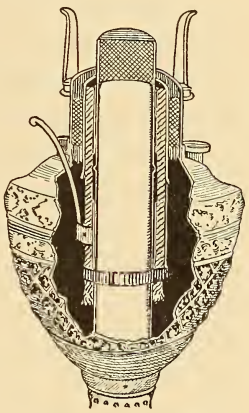
Artificial Light. — In winter, when the days are short and often cloudy, we depend largely upon artificial light. Many substances have served our ancestors to give light, including pitch-knots, candles, and oil. With artificial light, the use of the room should be kept in mind. In some rooms, a soft mild light is needed in every part. In other rooms, a bright light is needed in some particular place, and only a little light in the rest of the room.

Burning Kerosene. — Kerosene is a common source of light in towns where there is no gas supply. If used wisely, and with proper care, the light is good and safe. The chief objection to this light is the work and care necessary to keep the lamps in good order, and the necessity for good ventilation in the rooms.

Lamps. — There is a great choice in lamps. Metal lamps are much safer than glass lamps, especially where there are children in the family. The shape of the lamp makes some difference in the amount of light obtained. A broad shallow lamp is much better than a tall one. In a shallow lamp the wick is shorter, takes up more oil, and gives a brighter light. A very tall lamp is more likely to be overturned, has a longer wick, and gives less light.

Burners. — The circular burner, with a tube in the center for the air draught, gives more light than a flat burner. It is called a center-draught burner. The light in the lamp is like the fire in the stove. The

straight draught gives the biggest fire and the brightest light. Burners should be made of brass, and have two tubes, the large one for the wick, and the small one for safety, called the safety-tube, to allow the vapor from the oil to escape.



CENTER-DRAUGHT BURNER

Wicks. — The wick is a very important part of a lamp. It should just fit the tube, and allow for turning up and down, and just reach the bottom of the lamp. It should be renewed, or washed thoroughly, once a month.

Chimneys. — A good lamp may be spoiled by the wrong chimney. Each kind of burner has a chimney made especially to go with it. It is not enough that the bottom of the chimney should fit the burner. The chimney should also be of the right shape and height for that particular burner. There are over two hundred chimneys of different shapes and qualities. The right chimney is always cheapest in the end, for with it the lamp neither smokes nor gives off bad odors. It lasts the longest, and gives the best light.

Cleaning the Lamp. — Lamps should be cleaned and filled every day. Filling with oil drives out any vapor there may be in a half-empty lamp. Pieces of lamp black or matches on the burner should be wiped away. The wick should be cleaned by turning it even with the tube, and rubbing off the burned part. Never

cut off the wick. The chimney should be washed, dried, and replaced on the lamp. Once a week, the lamp needs to be entirely emptied, washed to remove any sediment, and refilled. Occasionally, perhaps once a month, the burner should be boiled in water with a little washing-soda. When not in use, lamps should be placed in a cool place, not near the chimney over the stove, to prevent their filling with vapors arising from the oil.

Safety-Lamps and Burning-Fluids. — In some places burning-fluids are offered for sale cheaper than kerosene oil. Most of them contain gasoline, benzine, and other dangerous liquids. No lamp burning these mixtures is safe. The sale of these fluids is prohibited by law in some of the states.

Burning Gas. — In different parts of the country there are several kinds of gas used for lighting. Those most commonly used are natural gas, coal gas, water gas, air gas or gasoline gas, and acetylene. Which do you use at home? Which have you seen burning?

Natural Gas. — Natural gas is obtained from wells from 150 to 3000 feet deep. A small building is erected over the mouth of the well, and pipes are laid under ground to deliver the gas. This is used in the natural condition, and can be sold much cheaper than coal gas. A well yields the most gas when first sunk, and then the amount gradually grows less. Some of the wells produce as much as 3,000,000 cubic feet of gas every twenty-four hours.

The Gas Fields. — Natural gas is used chiefly near

the gas-wells, but is sometimes conveyed fifty or sixty miles to furnish light for a city or town. It is used in parts of Pennsylvania, New York, Ohio, West Virginia, Indiana, Illinois, Kentucky, Kansas, Missouri, Arkansas, Texas, Utah, South Dakota, California, and other states. In these states there are over seven hundred and sixty companies distributing natural gas.

The Gas Flame. — For lighting, natural gas is usually inferior to coal gas. It burns with a bluish-yellow flame which is likely to flicker and to be unsteady. It is used largely for running boilers and for other industrial purposes. In Pittsburgh alone it is used under hundreds of boilers.

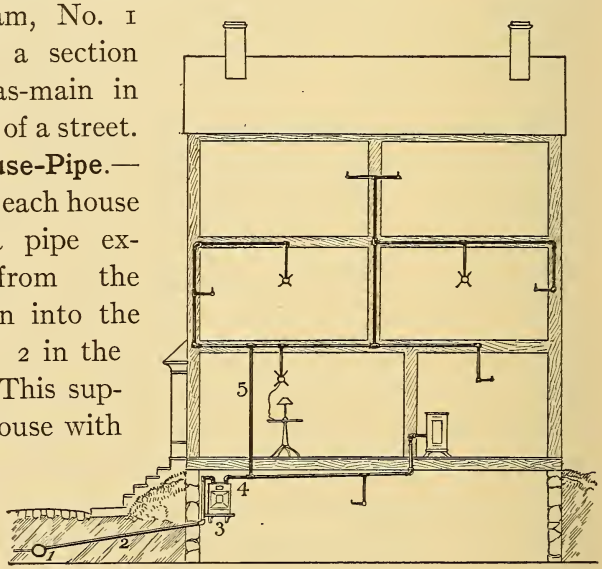
Coal Gas. — Probably coal gas is the most general means of lighting dwellings. If the proper burners are fitted and regulated, it gives a steady, brilliant, white light. With the right shade, it may be adjusted to the different uses of the house, whether for general lighting, or for close work like reading. It is easy to turn on and off by merely a twist of the gas-key. It is safe to burn with ordinary precautions against fire and leaks, and is little trouble to care for. It is also reasonable in price if used with judgment. The chief objection to it is that it robs the room of pure air. Good ventilation must be provided with gas burning in a room.

The Gas Supply. — In cities and large towns where gas is burned, a company manufactures the gas, and distributes and sells it to the users. At the gas-house, which is usually situated on the outskirts of the city, the gas is manufactured from coal, and is stored in a

large, round tank. Pipes are laid in the streets from the gas-house or plant to all parts of the city.

The Gas-Mains. — The large gas-pipe in the street is called the gas-main. It is a large iron pipe varying in size according to its location, and is usually laid about four feet underground to prevent freezing. In the diagram, No. 1 represents a section of the gas-main in the middle of a street.

The House-Pipe.— In front of each house there is a pipe extending from the street main into the cellar, No. 2 in the diagram. This supplies the house with gas. It connects with the gas-meter, No. 3, which measures the amount of gas used in the house.



System of Piping for Gas

The Gas-Pipes. — Connected with the meter there is another pipe, No. 4, which carries the gas up into the house. Many branches are given off from this pipe, and carry gas to all of the rooms. The gas-pipes are hidden cut of sight in the partitions and between the floors. The rooms of the first floor are lighted from

branches of a long pipe that extends above the ceiling of the first floor, from the front to the back of the house. Trace the path of the gas in the diagram. Each house is piped according to the size and the location of the rooms. Of course few houses are piped exactly alike.

Gas Fixtures. — Chandeliers or brackets are attached to the pipes in the rooms. They come in a great variety of designs, sizes, and prices, and are selected according to the kind of house and the use of the rooms.

The Burners. — A house may be well-piped, but unless the burners are wisely selected, whole, and properly regulated, the lighting will be poor. Formerly the broad, flat flame of the fish-tail burner and a ground glass globe were used, and the room was thought to be properly lighted.

The Incandescent Light. — Now, with the Bunsen and a few other burners, a brilliant, white, and steady light may be obtained. The modern burner is made long and tapering, with many openings to admit plenty of air, and to obtain a good draught. The amount of air admitted may be regulated at the base. The burner may be fitted with different shaped mantles, chimneys, and globes according to the use which the lamp is to serve. It may be erect, or inverted. Whatever form is selected, the lamp should be so placed and shaded that the light will not shine directly into the eyes of the person using it.

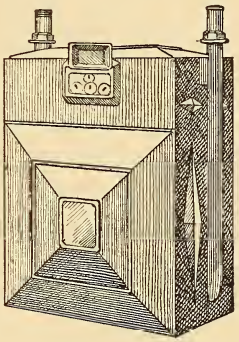
Causes of Escaping Gas. — Although a house may be piped with care at first, there is always the danger of gas escaping. There are so many joints in the pipes

and fixtures that some may become loosened. Then freezing and thawing sometimes make leaks outside in the street, and the gas may find its way into the house. Carelessness or ignorance is also responsible for many accidents. Thoughtless persons sometimes blow out gas instead of turning it out. Leaving a flame turned very low is dangerous, as a draught of air or an irregularity in the gas supply may put out the flame, without turning off the gas. With gas-heaters and drop-lights, many accidents have happened by turning off the gas near the burner instead of at the fixture. Sometimes the tube slips off and allows gas to escape into the room. Although gas has been used for many years there are still in this country about one hundred thousand accidents each year and about three fourths of them prove fatal.

How to Detect Escaping Gas. — Gas, fortunately, has a very peculiar and characteristic odor, so that one readily recognizes it. It is so very penetrating that a little gas seems to fill the entire room. But some people cannot smell, and they may be in danger without knowing it. If a leak is suspected, strong soap-suds may be rubbed over the joint in the pipe. The escaping gas will make bubbles as it pushes its way through the soap-suds.

Another Way to Detect Gas. — There is another sure way of detecting escaping gas. The gas-meter in the cellar registers all the gas that enters the house. All the burners in the house may be turned off, and the small hand on the index of the gas-meter may be watched.

If the hand is stationary no gas is passing through the pipes; if the hand moves, gas must be escaping, and something must be done. Don't look for the leak with a lighted match or a lamp. This is very dangerous, and is likely to cause a fire or an explosion.



A Gas-Meter

What to do when the Gas Leaks. — If the leak is small, and only a little gas escapes, send for a gas-fitter, and in the meantime keep the window open and the door closed into the rest of the house. If the leak is large the house may be suddenly filled with gas. Then open all the windows and leave the house quickly. Call a policeman or fireman if help is needed. Lighting a match or lamp is the most dangerous thing to do, and has caused many fires and explosions. Gas is very dangerous to inhale, and even small quantities breathed continuously make persons ill.

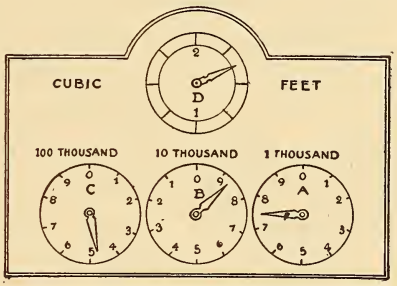
Precautions Against Fire. — With care, gas is safe. With ignorance and carelessness, gas is dangerous. There are many ways in which a house may catch fire from gas. Sometimes a gas-jet is too near the woodwork of the house, which becomes overheated, and bursts into flames. Sometimes a lace curtain or drapery is blown against a gas-flame, and sets the room afire. Paper shades that become heated are also a source of danger. Gas-jets that are in exposed places, like basements and passageways, may be protected with wire-cages.

Danger from Matches. — Matches also are a source of great danger. Burnt matches should always be thrown into tin or china holders kept for the purpose. They should never be thrown into waste-baskets or on the floor. Many fires have been set by matches thrown down carelessly. Any large quantity of matches should always be kept in tin boxes or earthenware or glass jars, away from mice and rats. Matches should be kept out of reach of small children. All young people should be extremely careful when handling light or fire.

Amount of Gas Used.— Gas is sold by the cubic foot, and the gas-meter in the cellar keeps the account. An inspector calls once a month and takes the reading on the index of the meter. Let us suppose the index in August read 28,500 cubic feet, and in September reads 37,900 cubic feet. The difference between the two readings, or 9400 cubic feet, is the amount of gas used between the two dates. If the price of gas is eighty cents a thousand cubic feet, the bill is $7.52. Gas varies in price in different cities from fifty cents to one dollar a thousand cubic feet. Meters are also made that will allow a certain amount of gas to pass when a coin is dropped into the part of the meter specially fitted for it.

Reading the Gas-Meter. — In order to verify the gas-bill every one should know how to read the meter. The diagram represents the index of a gas-meter. Only the three lower dials are read, as the upper, smaller dial is used in testing the pipes and the meter. The dials

read from left to right. The first dial on the left indicates the number of ten thousand cubic feet of gas up to one hundred thousand, the limit recorded by the dial. This dial reads four ten thousands or 40,000 feet. The middle dial indicates the number of thousand feet of gas up to its limit of ten thousand. This dial is read in the opposite direction from the other two. This hand indicates eight thousands, or 8000 cubic feet. The right hand dial registers the number of hundreds of feet up to its limit of one thousand. This hand reads seven or 700 cubic feet. The sum of the number of feet registered by all three dials, or 48,700 cubic feet, is the amount of gas used since all three dials stood at zero.



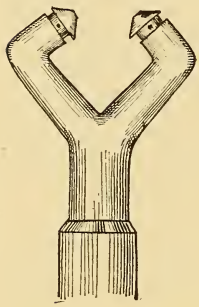
INDEX OF A GAS-METER

Water Gas. — Most of the gas burned in large cities is a mixture of coal gas and water gas. The water gas is made from steam and heated coal, and is much cheaper than coal gas. When unmixed with coal gas it has no odor, and leaks are not so readily detected as with coal gas. Water gas also contains more poisonous gases, and consequently is much safer to use when mixed with coal gas. When water gas is used alone in a house, it is extremely important that all connections should be perfectly tight.

Air or Gasolene Gas. — In towns or villages where

there is no gas supply, and sometimes in large isolated buildings, gas made from gasoline is burned. A gas machine is set up and pipes laid to the rooms or houses to be supplied. Gasoline and air are supplied to the machine, and the gas is formed and stored in a large tank. When the burners are fitted with mantles, and carefully regulated, a very good light is obtained.

Acetylene Gas. — When a supply of coal gas is not available, acetylene gas is sometimes used. The system necessary to make and distribute this gas is a generator, pipes, fixtures, and burners.



Burner for Acetylene Gas

The Gas-House. — The gas is made from a chemical called carbide and water. The gas generator is usually situated some distance from other buildings, and is connected by pipes to the buildings to be lighted. The pipes and fixtures are similar to those used for coal gas. Acetylene gas is very explosive, so that great care must be taken to have all the fixtures and joints in the pipes perfectly tight. A light should never be allowed in or around the gas-house. Many accidents and explosions have been caused by neglecting this precaution.

Acetylene Light. — The flame burns with a brilliant white light. It is more illuminating than coal gas, and less acetylene gas is needed for the same amount of light. Burners with small openings are made especially for acetylene. The gas has a peculiar odor which is easily

detected. It is less dangerous to breathe than coal gas, uses up less pure air in burning, and gives off fewer poisonous gases. Acetylene gas gives a very satisfactory light, but care must be taken in its use to prevent danger.

Electric Lights. — Electric lighting is now so generally used in public buildings that little needs to be said in its favor. Its cost is all that prevents it from being used everywhere in our homes. With proper current, lamps, and regulation, any desired amount of light may be obtained in practically any place. Its great advantage over lighting by gas is that it takes none of the pure air for burning, and it returns no poisonous substances into the air. Electric lights give out very little heat.

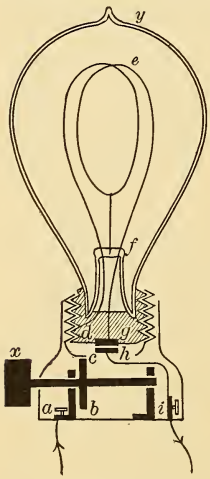
The Lighting System. — An electric lighting system may be small enough to light one building only, or it may light a city. In any case, it consists of three essential parts: first, the machinery to generate the electricity; second, the wiring to carry the current to all the places where light is desired; and third, lamps or bulbs to change the electric current into light.

The Electric Plant. — Electricity is generated at the electric plant, which is usually a large building, with a very tall chimney. Within are many dynamos driven by steam or gas-engines. A visit to one of these plants would be more instructive than reading about it.

Electric Wiring. — We are all familiar with the electric wires used for lighting. They are made of copper, and are usually covered with rubber or some other substance that does not conduct electricity. The large

service-wires are laid in the street within tubes, called conduits, made of iron, wood, or terra-cotta. Smaller wires are used in wiring a house, and are kept out of sight as much as possible in walls, partitions, and floors. The wire should always be laid so that it will not come in contact with any inflammable material.

The Electric Bulb. — The basis of all electric lighting in the house is the electric bulb. If much light is needed, several bulbs are used on an electrolier, similar to a chandelier for gas. For side-lights, brackets are made especially for the bulbs. For reading, there are stands in many styles for holding one or more lights. Electric bulbs are made of various sizes and shapes, according to their uses. Shades of many kinds, made of clear glass, ground glass, and ribbed glass of different colors, also are available.



Electric Bulb

Regulating Electricity. — One of the chief advantages in using electricity is the ease with which it may be controlled. It is easily and quickly turned on and off by simply turning a button. The lights of each room are usually wired together so that it may be lighted without turning on the lights in any other room. Switches and keyboards also help to regulate the use of electricity.

The Meter. — The electric meter, with a dial somewhat like the gas-meter, registers the amount of

electricity used in the house. It should be accurate, durable, and easily read, since its correct reading is essential in making out the bill.

Diffuse Lighting. — The heavy shadows of objects and persons are a serious disadvantage in artificial lighting. Diffuse light is more like sunlight and throws no shadows. The lamp is fitted with two large shades, one above and the other below the source of light. The ceiling and the upper third of the walls of the room are white and the lamp is suspended only a few feet from the ceiling. The light is first thrown upward by the lower shade onto the upper shade and the ceiling and then it is reflected downward to all parts of the room. This gives a soft, white light resembling daylight.

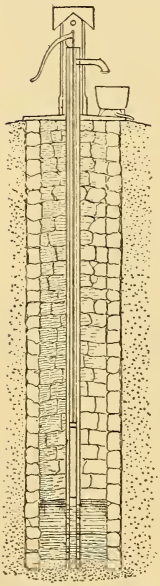
Summary. — 1. Eyesight is one of our most precious possessions.
2. The amount of artificial light used should always be carefully regulated to prevent strain of the eyes.
3. Oil, gas, and electricity are used commonly for lighting.
4. Many accidents occur from the careless and ignorant use of gas.
5. Leaks in the gas-pipes may be discovered by the odor of gas, or by watching the hand of the meter with all of the burners turned off.
6. A leak in a gas-pipe should be repaired immediately.

Questions. — 1. What is the effect upon the light of the room when the shades are pulled half way down? When pulled one quarter way down? When three quarters down?
2. How are your shades kept at home? Why?
3. What kinds of gas have you seen burning?
4. How do the flames differ?
5. How should a reading-light be placed? Why?
6. How should lights be placed for the general illumination of the room? Why?
7. Where should you turn off the gas of a drop-light? Why?

VII. HOW TO USE RUNNING WATER IN THE HOUSE

"And brim your cups with nectar true
That never will make slaves of you."
James Russell Lowell.

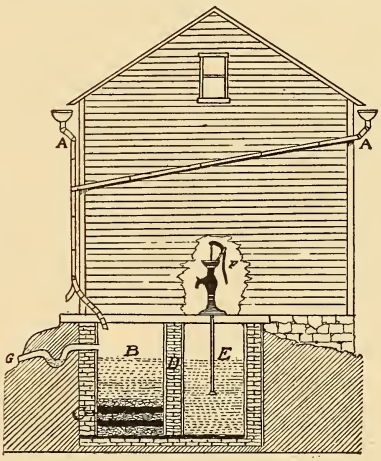
The Source of Drinking Water. — In towns and cities water is supplied to all the buildings through pipes laid in the streets. This is a water-service, and the owners of the buildings or the users pay for the water. In villages and isolated places in the country, there is usually no public water-supply. Each householder must obtain water as best he can. Water may be used from wells, springs, brooks, lakes, and rivers. All wells should be protected from impure water by tight-fitting covers and by tight brick or stone walls. They should also be located some distance from any source of impurities. Even then they should be tested carefully before using. Springs need to be protected as carefully as wells. The water of brooks, rivers, and lakes is safe only when their banks are kept clean, and when they are free from the openings of drains.



Well and Pump

Rain Water. — Sometimes rain water is all that is available. Then a pipe is extended from the roof to

a large, brick tank called a cistern, built underground near the cellar. Here the water is strained or filtered, and then it is ready to be pumped up into the house. Some people do not like the flat taste of rain water, but it may be supplied with air or aerated and cooled, and so made palatable. When well cared for, rain water should be free from disease carriers or germs, and should be safe to drink. Trace the path of the water in the accompanying diagram.



A Rain Water System

Wholesome Drinking Water. — Pure drinking water is without color, odor, and taste. A brownish color shows that there may be some soil mixed with the water. Sometimes sticks and branches of trees or leaves decaying in a well or lake may give the water a strong or fishy taste. Any unusual flavor or odor of the water shows that the source of the supply needs attention, and should probably be cleaned. Drinking water should also be free from the germs of diseases, like typhoid fever, that are often carried in unwholesome water.

Running Water in the Country House. — It is as possible to have running water in a house located in the country as in one situated in the city, but it

costs more, and requires more attention. There are four necessary conditions. First, a source of pure water, either a well, spring, pond, lake, brook, or river protected from pollution from drains, stables, and animals must be available. Second, pipes must be laid underground to carry the water to a large tight tank or reservoir for storing until it is needed for use. A tank may be located in the attic of a building or in a windmill. Third, there must be a pump or other machinery for lifting the water up into the tank. This pump may be worked by hand or by a windmill. Engines run by steam, gas, oil, electricity, or gasoline are often used. Fourth, distributing pipes lead from the tank or reservoir to those rooms of the house where water is desired. The pipes in the house are similar to those of a city dwelling.

Simple Arrangements. — Many houses situated in the country are inexpensive, and the arrangement of pipes or plumbing is very simple. A sink in the kitchen with a waste-pipe leading from it is all the piping there is in many country houses. Water from such a pipe should never be allowed to soil the ground near a house. Either the water should be led through a pipe to the garden or to a cesspool under ground.

Piping a City House. — In the city, where land is scarce and the dwellings are located close together, the houses must be built according to the building laws. Three pipes connect every city house with large pipes in the street. They are the gas-pipe, the water-pipe, and the sewer. The water-pipe, called the water service-

pipe, opens into the street-main which is a large pipe six inches or more in diameter and is laid near the middle of the street.

The Pipes in the House. — The service-pipe extends from the street-main through the cellar walls three or four feet underground. There are usually two shut-offs, or stop-cocks, one near the service-main and the other just inside the wall of the house. A shut-off is somewhat similar to a faucet, but the handle is longer and has only one part. It is important that every one should know where the shut-off is in his house, and that there should be a clear passageway to it. Then, when a water-pipe bursts, the water can be turned off quickly. Inside the wall the service-pipe runs directly to a tank situated in the upper story of the building.

The Storage-Tank. — This tank must be water-tight. Sometimes it is made of wood and lined with zinc, copper, or lead. Sometimes cast-iron tanks are made in pieces which are bolted together, so as to be perfectly tight. To prevent the tank from overflowing in case of accident, a pipe called the overflow-pipe is connected with it near the top. The overflow-pipe may lead to some basin, or it may be carried out under the roof to the open air. There are three pipes connected with the tank, the service-pipe, the overflow-pipe, and the delivery-pipe.

The Cold Water Pipes. — From the lower part of the tank a delivery-pipe draws the water from the tank, and distributes it by branches to the cold water faucets of the house. These branches are the cold water pipes.

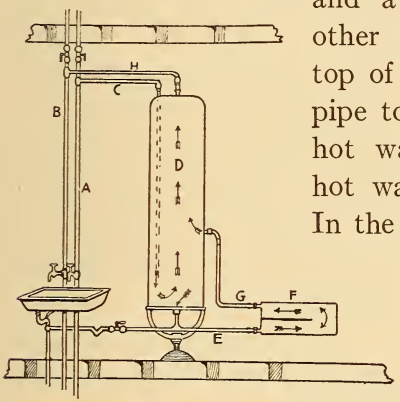
Often the cold water is taken directly from the service-pipe instead of from the tank.

The Sinks and Basins. — The kitchen-sink is used more than any other part of the piping or plumbing. Wooden sinks which can be kept neither tight nor clean are unsanitary. Steel, iron, enameled iron, and soapstone sinks do not absorb moisture, are healthful, and are generally used. In a large house there is also another sink located in the pantry which is used for washing glass, silver, and china.

The Tubs. — The bathtub is one of the most important items of plumbing. There are many kinds of tubs on the market, the materials being copper, zinc, iron, tile, marble, steel, and crockery. Those most used in modern houses are enameled iron. These are immaculate in appearance, and when the outside of the tub is painted to harmonize in color with the rest of the bathroom, they are very attractive. The bathtub rests on four short feet and is not boarded or cased around. This leaves no place for dust and dirt to collect. In all modern houses, laundry-tubs are set in the laundry. In apartments they are in the kitchen. Two and sometimes three tubs are set side by side. Those of soapstone are the most in use, as they are less likely to leak, and do not absorb moisture and dirt.

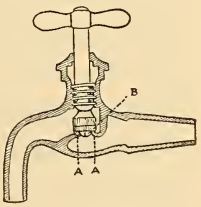
The Hot Water Supply. — Hot water as well as cold water is a great convenience. The water is heated in a coil of pipes or iron box called the water-front. This is placed in the kitchen-range in front of the coals or at

the back and ends of the coals, according to the kind of range. A bath-boiler, for the storage of hot water, stands in the kitchen near the range. The water-front is connected with the boiler by two pipes, a hot water and a cold water pipe. Two other pipes connect with the top of the boiler, a cold water pipe to supply the boiler, and a hot water pipe to supply the hot water faucets of the house. In the diagram trace the direction of the water from the cold water pipe, *A*, to the hot water pipe, *B*. It passes from *A*, through branch *C*, through the boiler *D*, through the short pipe *E*, through the water-front *F*, through the hot pipe *G*, the boiler *D*, branch *H*, and the hot water pipe *B*, to the faucets.



A Hot Water Supply

A Faucet. — A section through a closed faucet is represented herewith. At *A* is the passage that is opened and closed, as the handle is turned. Just above the opening is the washer *B*, that has to be renewed occasionally to keep the faucet tight.



A Faucet

The Water-Meter. — The meter records the amount of water delivered to a house. When a city spends millions of dollars to secure a pure

water-supply, it is necessary to know how much is used. Some cities charge for water according to the amount used. Meters also reduce the amount of water wasted by calling attention to leaks in the fixtures. As much as fifteen per cent of the entire water-supply may be wasted. The leaking faucet is responsible for much of this. Such cities as New York, St. Louis, Boston, Cleveland, Harrisburgh, and Milwaukee use meters.

The Wastes of a House. — Water has another important use in a house, that of carrying away some of the wastes. Wastes may be grouped as sewage, soiled water from sinks and tubs, garbage, ashes, old cans, bottles, iron, paper, rags, and other rubbish.

The Drainage System. — The water system of pipes carries water into the various parts of the house. The drainage system carries the soiled water and sewage out of the house into the sewer in the street. Many of the water-pipes and most of the waste-pipes are uncovered in modern houses, and may be located with little trouble. This open plumbing is a great convenience in locating breaks or leakage.

The Waste-Pipes. — Under each sink, washbasin, and tub is a waste-pipe to carry off the soiled water. All of these waste-pipes slope downward, and open into a soil-pipe that reaches from the attic to the cellar. In a small house, the plumbing is usually so arranged that all of the waste-pipes can open into one soil-pipe. In a large house, two or more may be necessary.

The Soil-Pipe. — The upper end of the soil-pipe extends three or four feet beyond the roof of the house.

This is necessary, so that the poisonous gases from the waste-pipes may escape into the air and not into the house. A pipe three or four inches in diameter is usually large enough for a single house.

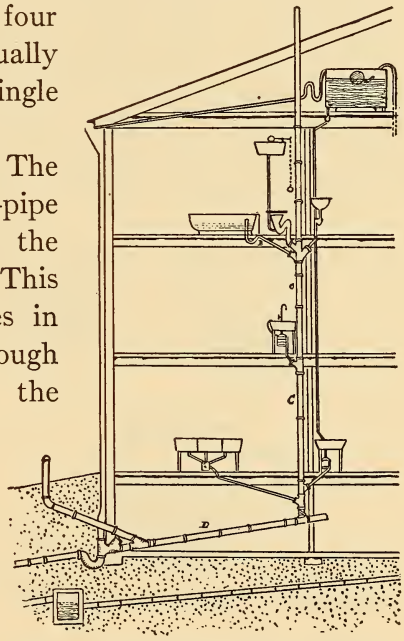
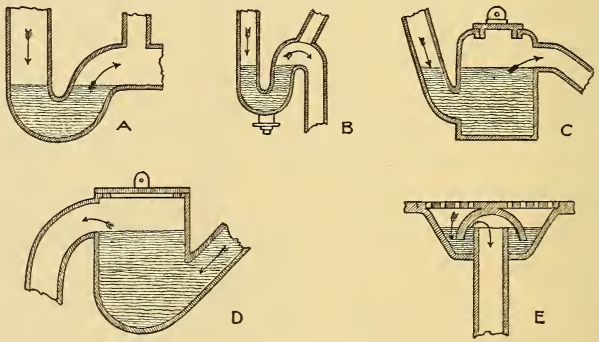


Diagram of Water and Drainage Pipes

The House-Drain. — The lower end of the soil-pipe bends, and continues in the cellar as the house-drain. This drain is often six inches in diameter, and runs through the cellar and through the wall at the front of the house into the street, where it opens into the sewer. It may be hung from the ceiling of the cellar, may rest on the floor, or be buried under the floor, according to the height of the house above the street sewer. The house-drain slopes downward toward the street.

Running Water through the Pipes. — In the diagram the passage of water through the pipes from the bathtub to the sewer may be traced. When the overflow pipe is reached, or the stopper in the bathtub is pulled, the water rushes down the waste-pipe, *B*, to the soil-pipe, *C*, through the house-drain, *D*, to the sewer which is under the street.

Sewer-Gas. — Ill smelling gases are being formed all the time in sewers, and are trying to escape. If the drains are not tight, the gas will escape upward into the house. The drains must also be fitted with bends or traps which hold water, and which prevent the gases from rising in the pipes. Water in a trap seals the pipe as a cork does a bottle. The constant breathing of these poisonous gases even in small quantities is very



Water Traps

unpleasant, although it may be difficult to prove that they cause actual sickness.

Traps. — Any bend of a pipe that will hold water is called a trap. The trap holds the last water that passes through the pipe. A trap is placed in the waste-pipe under every tub, sink, washbasin, and closet in the house, as well as in the house-drain just outside of the cellar wall. Different kinds of traps are represented in the above illustration. The simplest trap is shown at *A*, being merely a bend in the pipe, and is sometimes used in the house-drain. *B* illustrates the

trap that is often used under a washbasin, and shows the cleanout which is easily unscrewed for cleaning out the trap. *C* and *D* show traps that are commonly used under bathtubs, kitchen-sinks, or laundry-tubs. In the bathroom, the trap may be hidden in the floor with the upper part or cap on a level with the floor. *E* is a section of the trap in the kitchen-sink with the strainer in position.

Ashes. — Ashes should be regularly removed, at least once a week. Some cities require that all ashes shall be kept in iron barrels or receptacles. Many fires have started from the placing of hot ashes or live coals in a wooden barrel or box. If ashes are sifted, a modern covered sifter should be used, to prevent the dust from escaping into the cellar. In most cities the health department attends to the collecting of the ashes. In order to be collected, the barrels must be placed out of the cellar or on the sidewalk, according to the local regulations.

Ash Disposal in the Country. — Here each household takes care of its own ashes. The coal ashes are sifted, and may be used to make paths, to fill in low places, or to improve the condition of the garden. Ashes for these uses should be kept dry, and free from garbage and all decaying matter. Wood ashes are a well-known and valuable fertilizer for growing plants.

Garbage in the City. — In most cities garbage also is collected by the health department. It should be collected daily in the summer and two or three times a week in the winter. Garbage from the kitchen should

never be thrown into the sink, but should be drained and kept covered in a galvanized iron can or barrel. A small garbage-house of wood is often built near the back door to hold these receptacles. It is very important to keep the garbage can covered and the door of the house closed, or hungry dogs and cats of the neighborhood may spill and scatter the contents.

Garbage in Towns. — On the farm, the scraps of food may be fed regularly to the pig, the hens, and other animals. In towns and villages, if no animal is kept, the garbage may be dried and burned in the kitchen-range. There are incinerators that may be attached to the smoke-pipe of the kitchen-range for the disposal of garbage, but they are not in common use.

Refuse. — In a house, waste material, like paper, rags, straw, etc., is constantly accumulated. The city wagons will collect most house refuse. In rural districts it should be burned at a distance from buildings and trees.

Other Rubbish. — There are always old tin cans, scraps of iron, broken crockery, glass, plaster, and miscellaneous articles that cannot be burned. The junk-dealer may be glad to take some of these articles, and sometimes it is possible to bury a small amount of refuse. As a last resort it may be taken to the town dump. This is usually situated out of town and out of sight from the public road. In many cities each house must have two covered receptacles. There must be one covered iron barrel for ashes and refuse of all kinds, and a second covered iron pail or barrel for the garbage.

Cleaning-up Days. — Many cities now have special "cleaning-up days" when a great effort is made to clean yards, sidewalks, and streets. Usually the sanitary inspector is a leading spirit in the movement, and often the co-operation of the children is sought. Sometimes a "spotless town" crusade is started. Thousands of leaflets are then distributed. The newspapers preach the gospel of cleanliness, and print photographs of some "guilty backyards." The children are the best aids in helping to clean their own yards.

Summary. — 1. Wholesome drinking water is free from disease germs and without color, odor, and taste.

2. Rain water may be made wholesome by filtering.

3. Running water may be put in the country house as well as in the barn.

4. The system of cold water pipes in a city house includes the service-pipe, the tank, the delivery-pipes, the faucets, the tubs, and the basins.

5. The drainage system consists largely of waste-pipes, traps, and soil-pipes.

6. Health demands that all of the wastes of a house should be removed quickly and in a sanitary manner.

Questions. — 1. Can you trace any of the water-pipes in the school building?

2. Where are the waste-pipes? The traps?

3. What happens when you turn a faucet? Why?

4. What are the advantages of keeping the different kinds of waste separate?

5. Why should the garbage-barrel be made of galvanized iron and kept covered?

6. Why is an iron ash-barrel preferable to a wooden one?

VIII. HOW TO FINISH AND DECORATE THE HOUSE

"Continual thought upon beautiful things silently brings forth a beautiful spirit." — *Henry Turner Bailey.*

Healthful Surroundings. — A safe shelter protects us from the weather, from disease, and from other perils. We have found that a hygienic house must supply room and fresh air, proper warmth and light, and pure water and safe drainage. But this is not all, for men have minds and souls to be cared for as well as bodies. The home is the place for the growth and the development of the whole girl and boy. Beautiful surroundings are as necessary for a cultured person as good food. Some persons are willing to go without costly food in order to buy a beautiful book or an inspiring picture.

Beautiful Surroundings. — It is desirable for us to have beautiful objects about us, so that we shall gradually learn to know the beautiful from the commonplace. If we are thoughtful, we should be able to tell whether curtains, chairs, tables, rugs, and china are really beautiful, or merely pretty, or fashionable. This will soon lead us to love beautiful things in our homes. When we have the opportunity, we may help to choose them in the place of more highly colored or striking furnishings. The beauty of a house does not always depend upon its size, or upon the cost of its

decorations and furnishings. The culture and taste of its owner are more important in selecting those furnishings that are beautiful and harmonious. Perhaps thinking about houses will help us to arrange our own rooms at home simply but in good taste, and help us to keep them in good order.

The Woodwork of a Room. — If we think of the dining-room or the living-room at home, we can name the different parts of the woodwork. The window-frames, the door-frames, the doors, the base-boards or mopboards, and the mantle are the chief parts. Can you think of other woodwork sometimes found in rooms? Usually all the woodwork that is seen in one room, except the floor, should be alike. Sometimes, however, the picture-molding and the doors are of another kind. As a rule, the wood should all be of the same kind, whether pine, whitewood, or oak. It should all be finished alike, either painted, stained, or varnished. Do you find any wood in the schoolroom that is painted? Do you find any wood that is varnished? All the woodwork of the room should be of the same color as well as of the same finish and kind of wood.

Finishing Woodwork. — The surface of woodwork is always finished, either to preserve it or to improve its appearance. The most common ways of finishing wood are polishing, varnishing, wax-finishing, oil-finishing, and painting. Sometimes woodwork is stained before it is finally finished. The use of the room will often determine the finish of the woodwork. The reception-room or living-room may be finished in white, while

the dining-room and bedrooms may be kept in a natural brown or stained dark green or dark brown. A chamber is appropriate in white, natural wood, or stained.

The Walls. — The walls are the most important area in the finished room. They form the background against which the furniture and the pictures appear. The walls cover a large space, and may be divided into three parts: the dado, the filling, and the frieze.

Different Spaces. — In medium-sized rooms it is seldom that the walls are divided into more than two of these spaces. The dado of a room begins at the floor, extends upward nearly three feet, and may be finished with a molding at the top, to protect the wall from chairs. In many rooms the dado is reduced to a mere board eight inches high, called the base-board. The frieze is at the top of the room, or comes next to the moldings just under the ceiling, called the cornice. The frieze varies in width, and may be nine inches or more deep. It is sometimes finished at the base with a wide molding for the display of china or pottery. In small rooms, the walls seem higher when the frieze is omitted and the picture-molding is placed close to the ceiling. The filling is the space from the top of the dado or the base-board to the frieze or the molding. This is the part that stands directly back of the furniture and pictures.

The Wall Coverings. — The appearance of the wall depends upon three things: first, the manner of covering; second, the color chosen; and third, the pattern selected. There are several ways in which walls are

decorated. Some of the most beautiful walls are covered with panels of wood. Mahogany, oak, and other beautiful woods are used for this purpose, and are so finished as to bring out their wonderful grain and color. This is very costly, but some of the museums show rooms



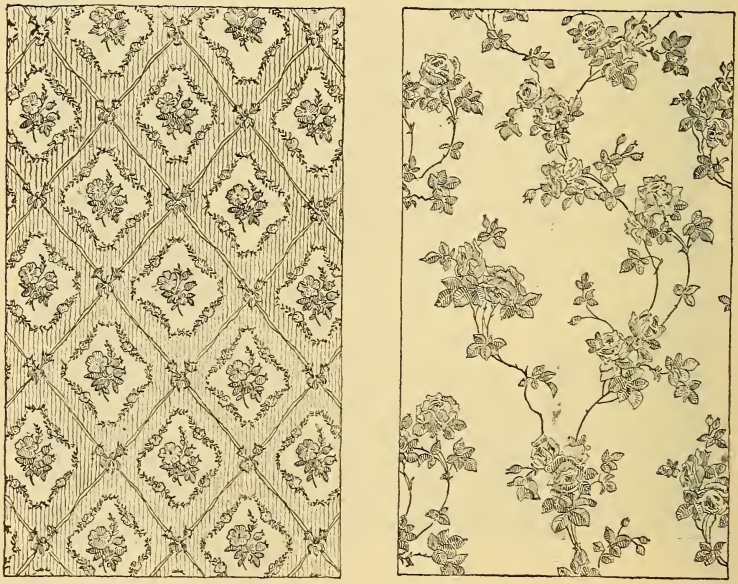
A Room with Walls of Wooden Panels

entirely finished in wood. Sometimes burlap, canvas, or tapestry is used on walls instead of wood.

Painted Walls. — Some rooms like the kitchen, bathroom, or back hall need to have very serviceable walls. A painted wall will last a long time, and may be washed when soiled. A good color like light brown or green makes a very attractive and appropriate wall. Sometimes when a plain color is desired, a room is calcimined.

When walls finished in this way become soiled, however, they cannot be washed, as the calcimine also comes off.

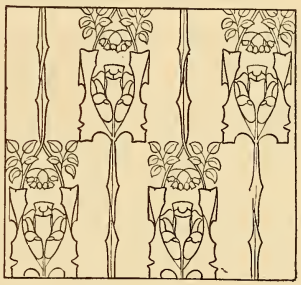
Wall-Papers. — Probably most of the walls in small houses are papered. A good wall-paper lasts several



Two Good Wall-Papers

years, with care, so that great care should be taken in choosing the paper. It is a great mistake to decide upon paper from the small samples made up in books. When possible, two lengths of the paper side by side should be held up against the wall to be papered. The light, the size of the room, the color of the woodwork, the rug, and the furniture should all be considered before

deciding upon the paper. The two most important matters in choosing a paper are: first, the color, and second, the pattern. Most papers are made with some color predominating, as green, brown, red, blue, or pink. Some are made with a light background and with a figure of a darker shade.



A Good Design

Choosing Wall-Papers. — After deciding upon the general color of the paper, it is necessary to think of the pattern or figure. Good plain papers without figures are the most satisfactory in many rooms. They are not so likely to fade or to become tiresome. They also make a more satisfactory background for pictures. Next in value stand the two-toned papers in stripes, lines, or inconspicuous figures. These papers are called two-toned because they are printed in two tones of one color, green, brown, etc. If there are only a few pictures, or only very small pictures in a room, a figured paper may be desirable. One with an all-over pattern and showing little background is the most pleasing. Conventional designs are always preferable to natural effects.

Wall-Papers to Avoid. — Sometimes our mistakes in selecting wall-papers are only discovered after the papers are on the wall. Avoid very conspicuous and bold stripes, loops, festoons, or set figures. Avoid very striking effects. Too large a figure becomes tiresome.

Avoid a paper with figures arranged in parallel lines in several directions, which tempt one to count the figures. A good wall-paper should be subdued enough to serve as a background to the rest of the room.

Papers for Different Rooms. — The walls of a vestibule must be made to withstand exposure to dampness and cold. When these walls are not painted, a thick embossed paper is suitable. In the hall, a serviceable paper is also necessary. It may be medium or dark in color, and the background well covered with some broken, inconspicuous pattern. The living-room, dining-room, and reception-room are often papered with plain or two-toned papers. In the bedchambers, light papers with pretty, flowery, all-over patterns are popular. Varnished papers which will not absorb the moisture are made for bathrooms.

The Floors. — The floor is next to the wall in importance in the completed room. Good floors add very much to the appearance of a house, and with good and constant care will last for many years. In the better houses most of the floors are of hardwood, pine, oak, or maple. They may be varnished or waxed and polished, and are easily cleaned. The floor in the vestibule is often tiled. It is made of inch cubes of marble or tiles of one or two colors. Those laid in geometrical patterns are the most attractive. Tiles may also be used in the bathroom. The kitchen floor is usually a good, oiled, hard pine floor.

The Ceilings. — The ceiling is another large area in a room which must receive attention. The wrong

treatment of this space may make a room appear too high or too low. There are many ways of finishing a ceiling, depending upon the size, the height of the room, and the cost. A well-decorated ceiling adds much to the appearance of the furnished room.

Plain Ceilings. — The simplest way to finish the plastering on the ceiling is to whiten it from wall to wall. If this is not desirable, it may be given some light tint to harmonize with the walls or carpet. Sometimes ceilings are painted to cover imperfections or cracks or patches in the plastering. Painted borders of flowers, fruit, or autumn leaves are out of place on the ceiling. A plain surface is always to be preferred.

Papered Ceilings. — Sometimes the ceiling as well as the walls of a room may be papered. Light colored papers with small geometrical patterns are made expressly for ceilings. Papers with large floral patterns should never be put on ceilings, as they make the room appear very low. A room with a papered ceiling always looks smaller than one with a plain white ceiling. Sometimes a large room, with the wall and ceiling spaces very sloping and cut up, may be improved by allowing a well-covered paper to run up over the ceiling.

Decorated Ceilings. — In very elaborate rooms the ceilings usually form part of the decorations. Open ceilings without plastering are often used, and the large floor beams are finished like the rest of the woodwork. Plaster ceilings may be divided into spaces or panels by moldings. Such spaces are usually tinted to harmonize with the woodwork. Ceilings are sometimes

covered with canvas, embossed paper, stamped steel, and other coverings which are held in place by moldings.

The Windows. — There should be plenty of windows in a house to admit light and air, two prime necessities for health. A room without a window opening to the outside should never be used for sleeping. The dark



A Room with Attractive Windows

bedroom has proved one of the perils of city life. Clear plain glass always looks well, although plate-glass is used in the best houses. Small panes often give a pleasing effect to an otherwise clear space. Leaded glass looks well in suitable places, like a hall. The so-called "art glass" is not very suitable for houses, as most of the colors and designs are crude.

The Doors. — The doors usually match the woodwork of a room in color and finish. But with white painted

woodwork, mahogany or white doors may be used. When the effect of a large space is desired, the doors may be removed, or be made to slide into the wall. The large doorway may be left open or curtains or portieres may be hung to cut off a draught of cold air.

Permanent Furnishings. — Window-shades and ranges are usually put in place before a house is ready for the family. The window-shades should be alike all over the house, and should harmonize with the color of the exterior. No bright color should be used that would not be likely to harmonize with the furnishings. Medium shades of green and linen color are the best for the eyes, and they are likely to harmonize well with the colors of furnishings.

Principles of Decoration. — Experience has taught us many facts in regard to choosing and arranging our rooms. Reading and trying experiments in our own rooms will teach us many more. The three essentials of a satisfactory room are good proportions, harmonious color, and suitable furnishings. It is difficult to make a success of a very low or a very high room, of a very long or a narrow room, or of a very irregular room. The decorations and furnishings must be so selected that the low room shall appear higher, for example, by raising the picture-molding. The very high room may be improved by using a wide frieze. In many ways the apparent size and shape of rooms may be changed.

Color in Decorations. — In a successful room the color *must* be right. We may forgive mistakes in poor

patterns on the wall, or unsightly furniture, but we can never forget glaring clashes of color. The general color of a room should be subdued and restful without being gloomy. It should be harmonious without being monotonous. Very unusual as well as very brilliantly colored furnishings should be avoided. It seems a great problem to obtain harmony of color out of the many objects of different colors in one room. Let us see how other people have solved the problem.

Color Schemes. — Whatever colors are used in decorating a room, there should be a gradation from the floor to the ceiling. The darkest shades should be on the floor coverings, the next lighter on the walls, and the lightest tones on the ceiling. One way of producing harmony in the color of a room is to have all of the furnishings of one color. For example, in a brown room the lighter tints and the darker shades of brown should be used to relieve the monotony of a single color. White curtains and table covers may improve the room. Another plan would be to use two colors instead of one. One dark color like green could be used for the rugs and furniture, and a little red or yellow in the hangings and covers would brighten the room and make it more cheerful.

Contrasting Colors. — Sometimes two strong colors are used in the same room. The colors chosen should be complementary, as dark red and dark green, olive yellow and dark blue, or dark green and dark violet. The dark shades of these colors should always be selected as the brighter tones would make a room too brilliant

and highly colored. Some good combinations of colors are: violet and amber, dull orange and slate blue, chocolate and pea green, deep red and medium gray, sea green and golden yellow, golden brown and olive green, deep blue and yellowish green, and indigo and light olive green. It would be well to try these colors together, and see which combinations you prefer.

Summary. — 1. The appearance of a house depends very largely upon the finish and decorations.

2. An attractive house lessens worry and discontent, which are harmful to health.

3. Most of the woodwork of a room should be alike in color, finish, and kind of wood.

4. The wall is the most important space of a room, and serves as a background for the furnishings.

5. Hardwood floors are most healthful as well as substantial and handsome in appearance.

6. The plain white or light tinted ceilings are best for small houses.

Questions. — 1. What rooms have you seen with a dado? With a frieze?

2. What kinds of wood do you know?

3. Can you bring to school a piece of pine, white wood, or spruce?

4. Can you bring to school some samples of wall-paper, and tell whether they are attractive or not?

5. What kinds of wall-paper are suitable for different rooms?

6. What kinds of wall-paper become tiresome?

7. Where are painted walls suitable?

8. What are some color combinations that are appropriate for rooms?

9. What colors harmonize with green, brown, and blue?

IX. HOW TO FURNISH THE HOUSE

"Have nothing in your houses that you do not know to be useful or believe to be beautiful." — *William Morris.*

General Principles. — The decorations of a room form a background for the furnishings and for the family. Any plan or scheme for decoration needs to be carried out in the furnishings. These should be selected with a thought for their fitness for the place and their proper color relations. Right proportions should always be remembered. A small room or house would be smothered in furnishings that would be entirely suitable for a larger space. Furniture and curtains made for one room would often be entirely out of place in a room devoted to other uses. If the color of the furniture, curtains, draperies, rugs, and covers does not harmonize with the walls, the room will not be a success.

The Useful and Beautiful. — Many people think of useful and beautiful things as entirely distinct, just as they have common, plain suits and elaborate gowns. As some one has said, "The ideal of beauty is simplicity and repose." So we may select useful and simple furnishings that shall also be beautiful. A house should never be overfurnished, so that there is little room left for the family to move about. There are many ways of furnishing the same house beautifully, so that there is ample opportunity for each person to select the things that he likes.

The Hall. — The first impressions of a person are always lasting. So the appearance of the first room that is seen — the hall — is important. A hall should be cheerful, dignified, and somewhat formal. Good halls may be made in dark red, green, terra-cotta, or brown. The hall is used probably more than any other room of the house, so that the furnishings should be durable and of good quality.

Hall Furnishings. — The wall-paper may be dark and serve as a neutral background for the different rooms that open into the hall. The rugs should be serviceable, and not show the footmarks of every chance caller. The thick, rough mat outside the front door will save some dirt from being carried into the house. Few pieces of furniture are really necessary. A good dark chair, table, and umbrella-stand will furnish a small hall. When there is room, a high-backed settee, a small wooden hall chair with a box-seat, and a mirror may be added. A few good pictures give color to the walls. Pictures of places or buildings are appropriate to the hall. Good Japanese prints are also attractive.

The Floor Coverings. — The right coverings for the floors add much to the appearance of the house. Floors may be covered with carpets, rugs, or mattings.

The Carpets. — The day has passed when all of the floors of a house were covered with carpets. Many houses today have no carpets tacked down. The great disadvantage of carpets is that they collect and hold dust which is only carried out of the house once or twice a year. Carpets, however, have some good points.

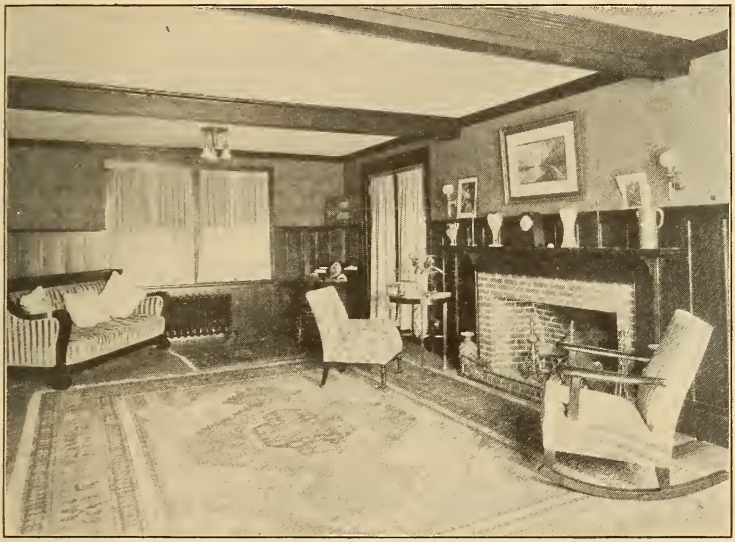
They deaden the sounds in a house, for usually there is a layer of thick, padded paper under a carpet. They also make a house warmer by stopping any cracks that there may be in the floor. Carpets also give more color to the house. On the whole, the uncleanliness and great labor connected with the use of carpets has gradually resulted in their banishment.

The Rugs. — The use of polished floors and rugs is very largely taking the place of carpets and mattings. The waxed floor has a very substantial, solid, and distinguished appearance. Any severity and monotony may be relieved by the use of well-selected rugs.

Variety of Rugs. — The problem of selecting the right rug for any place becomes difficult when we look at rugs. There are many kinds, colors, sizes, and patterns. There are rugs made of widths of carpeting by adding fringe at the ends. There are rugs woven with a complete pattern and border around the four sides. Rugs are shown in all colors. Some have one solid color, and some have patterns in two or three colors, and still others are woven of many colors. Oriental rugs are in the greatest demand for their beautiful coloring and harmonious effects. When these are out of the question, a good substantial rug made in a small pattern and subdued color will prove satisfactory.

The Living-Room. — The largest, pleasantest room may be furnished simply, substantially, durably, but attractively, as the living-room. One large rug in the center of the floor is better than many small ones. This may be woven in one piece or may be made of breadths

of carpeting with or without a border. It may be solid in color or have a geometrical pattern. Elaborate flower designs are out of place in a carpet or rug. We dislike to walk on the representation of flowers as well



A Room showing Simplicity and Taste

as on the real flowers. The furniture should be substantial, comfortable, and beautiful. In the living-room, dark oak or dark green is appropriate. Several chairs of different sizes and a couch are useful in this room. A substantial table is needed for the reading lamp and magazines. Cases for books, a piano, and a desk may also be useful in some families.

The Furniture. — In the shops, furniture of every style, color, design, and wood is offered for sale. French furniture is slender in outline and often highly decorated

in colors and tapestry. Dutch furniture is solid, heavy, and substantial. There are many different styles in English furniture, much of which has been brought to this country. Mission furniture is much in favor today. It certainly is substantial and strong, and some of the chairs are very comfortable. Often only a few pieces of this kind of furniture are needed for a room.

Furniture for Different Rooms. — Mahogany furniture, which is very much desired for its color, is especially good in a library, living-room, or dining-room. Oak chairs if stained dark are desirable for a hall or dining-room. In a living-room, hall, or reception-room, the chairs should not all be alike. They should, however, be of the same wood, of the same color, and of the same general style. In the dining-room, all of the small table chairs should be alike.

The Pictures. — The culture and taste of the family is always shown by the pictures on the wall. Pictures need to be selected, framed, and hung with great care. The pictures that are adapted to a house are sometimes merely photographs of views. These should be selected with great care. Some popular pictures tell a story, like "Can't You Talk." At first they are very attractive but many soon become tiresome. Reproductions of the pictures of great artists are the most satisfactory in the end. Perhaps there are some fine pictures in the schoolroom or at your home. Perhaps the public library or a museum may have good pictures. Neither funny nor sad pictures should hang upon the walls of a room. A picture should be an inspiration for better living.

Pictures for the Home. — A few reproductions of good pictures for the home are: the "Sistine Madonna" by Raphael, the "Frieze of the Prophets" by Sargent, "A Decorative Angel" by da Forli, "Innocence" by Reynolds, and "Aurora" by Guido Reni. Perhaps



A Good Picture for the Home
"Aurora," by Guido Reni

copies of the landscapes of Corot and Inness or the animals of Bonheur and Landseer may be selected.

Framing Pictures. — A frame about a picture separates it from all other objects. Brown photographs may be framed in brown of a tone a little lighter than the darkest parts of the print and darker than the lightest portions. Water-colors and colored Japanese prints may be framed with white mats and narrow gilt frames. Oil-paintings usually have dull gilt frames.

Hanging Pictures. — A picture should hang by two pieces of picture-wire from two hooks attached to the picture-molding. It should be low enough so that a person standing can look into the center of the picture.

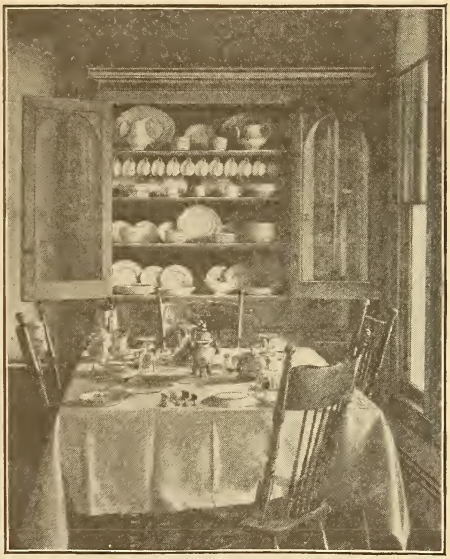
Pictures should be grouped carefully to give the best results, photographs in one place, oil-paintings in another, and water-colors in still another. In arranging pictures a certain balance should be preserved between pictures or groups of pictures. A horizontal space demands a horizontal picture and an upright space an upright picture. The smaller pictures preserve the balance and make variety. Sometimes hanging a picture in different positions and lights helps to determine its proper place.

The Family Portraits. — Pictures that relate to the life of the family, like portraits, diplomas, and photographs, should be framed as simply as possible and hung in the bedrooms. Other pictures of a more general character are more interesting to our friends.

The Dining-Room. — A simple dining-room is always in good taste. A large rug in the center of the room, or several long ones around the table, help to make the background. A beautiful round or square polished table is the center of interest. There should also be several dining chairs, and perhaps one or two easy chairs. A couch or window-seat may sometimes be useful. A simple sideboard or a table with hanging shelves will be needed unless a china-closet is built into the wall.

Beautiful China. — In some dining-rooms the beautiful silver, china, and glass are the chief ornaments. Sometimes a wide molding, called a plate rail, is run around the walls, two feet or more from the ceiling. Here beautiful plates, bowls, cups, and saucers may be arranged. No china that is in daily use should be

kept here. A collection of old pewter would add distinction to any dining-room. Only large pieces of silver and candle sticks are displayed on the sideboard.



A Simple China Closet

The Curtains. — No room is furnished without suitable curtains. The appearance of the windows from the street must first be considered. In the city, in many small houses and in apartments, a thin curtain is hung the entire length of the window. This hangs from a brass rod and stops at the window-sill. These curtains are made of various materials and of different colors to harmonize with the furnishings of the rooms. Lace, net, silk, or linen are appropriate for the living-room, dining-room, or hall. Muslins often hang in the bedrooms.

The Sash Curtains. — Often a short curtain is hung from a brass rod at the middle sash and reaches the window-sill. Such curtains are useful in a kitchen or bathroom and can easily be kept clean.

The Draperies. — When the appearance of space is desired, a door may be removed and a curtain or por-

tiere be hung in its place. A portiere should harmonize with the furnishings on both sides of it. Portieres are often made double, with one color on one side and another color on the other. They are hung by rings from a pole extending across the doorway, and drop within an inch of the floor. Many beautiful textiles are sold for portieres, including tapestries, brocades, silks, and velours. Denims and burlaps are not to be ignored.

The Covers. — These same materials may also prove useful as covers for couches or window-boxes. Even as covers for cushions and pillows they are much more decorative than the painted heads or colored animals so often seen.

The Kitchen. — Although out of sight to the casual caller, the kitchen is one of the most important rooms in the house. Everything in the kitchen should be useful, kept absolutely clean, and in its place. With the stoves, sink, and table there is little room for unnecessary objects. The laundry-tubs are also in the kitchen in many small houses. When the floor is poor and full of splinters, a good linoleum, similar to a thick, plain oil-cloth, may be laid over the entire floor. A well-kept kitchen is the pride of a good housekeeper. She is known by the condition of her kitchen rather than her reception-room.

The Bedroom. — The ideal bedroom is sunny and clean. The place where we spend a third of our time should receive thought and care. A good motto would be that taken from an old sun-dial, "The sun shines for all." Even the paper on the walls should be light and

airy. Papers with a white or cream ground and pink, blue, or yellow flowers are most popular. Even the furniture may be white or light in color. Curtains, draperies, and covers should all add to the daintiness of the room. In the rooms used only for sleeping, little



A Comfortable Bedroom

furniture is needed. The bed, a small table at the head of the bed, two or three chairs, a bureau or a dressing-table and mirror, and a wash-stand should be enough for one person. Two single beds or "twin beds" are now preferred to the old time double bed. A few good pictures and well-selected ornaments are more restful and more easily cleaned than a number of knicknacks.

The Bedroom and Sitting-Room. — A bedroom must often serve as a living or sitting-room to countless people who board in large cities. Then great care is

usually taken to hide the most evident bedroom furnishings behind screens and in closets. The substantial and comfortable couch may serve as a bed at night. Chairs, tables, books, shelves, good pictures, and suitable curtains must complete the transformation by day. The furnishings should be durable and resemble those of a living-room, rather than light and dainty like a bedroom.

The Girl's Room. — How pleasant it would be if every girl could have a pretty room of her own! Then she could help fit it up in her favorite color — pink, blue, or yellow. Good rugs on the floor, light wall-paper and furniture, and spotless white curtains would make a dainty room. Here a girl can keep all of her personal belongings. This is the place for the book-case to hold her few intimate books. Here she may keep her family of dolls, her collection of photographs, of stamps, of games, or whatever interests her most. A pretty room must be kept in order and perfectly clean to be attractive. How much we can tell about a girl from the way in which she keeps her own room!

The Boy's Room. — In too many houses there is no room for the boy. So he finds a place for himself on the street or in somebody else's yard. Still a boy usually has more possessions than any other person in the house. Where is he to keep his skates, his hockey stick, his wild Indian costume, or his baseball bat and other necessities, if not in his own room? He usually cares little for color schemes, and his furniture must be substantial and durable. A case for his books and a cabinet for his collections will make it possible to keep

the room in order. For if he is to become a valuable citizen, he should acquire habits of order and neatness about his room.

Results. — With all our thought and expense, we have only provided the setting or surroundings for the family. As Dr. Gannett has said: "And still one thing



A Boy's Room

remains to furnish the House Beautiful, the most important thing of all, without which guests and books and flowers and pictures and harmonies of color only emphasize the fact that the house is not a home. I mean the warm light in the room that comes from kind eyes, from quick unconscious smiles, from gentleness in tones, from little unpremeditated caresses of manner, from habits of thoughtfulness for one another, all that

happy illumination which, inside of a house, corresponds to morning sunlight outside falling on quiet dewy fields."

Summary. — 1. The decorations and furnishings of a house should harmonize.

2. The various rooms of a house should be furnished according to their uses.

3. The living-room should be the pleasantest room in the house.

4. Furniture should be selected with reference to its use and its style of make.

5. Curtains should soften the direct sunlight rather than exclude the light and air.

6. Curtains that can be laundered are more sanitary than heavy thick fabrics.

7. Cleanliness is the ideal of kitchen and bedroom.

Questions. — 1. What makes a useful object beautiful?

2. What furnishings are suitable for a hall?

3. What floor coverings are most hygienic? Why?

4. How shall we choose our rugs?

5. What furnishings are necessary in a dining-room?

6. What pictures would you like for your home?

7. How should a picture be framed?

8. What does a girl like in her room?

9. What would a boy like?

X. HOW TO CARE FOR THE HOUSE

That house indeed is firm and stout
Which can keep all trouble out.
Old English Motto.

Houses Built for Years. — In the olden times houses were so well built that they lasted for years. There are several houses in New England that have stood for



The Fairbanks House

two hundred and fifty years or more. The Fairbanks house in Dedham, the Pierce and Blake houses in Dorchester, the Nurse house in Danvers, and the Roger Williams house in Salem were all built in Massachusetts previous to 1650. Many of the old houses situated in the cities have been pulled down to make room for modern fireproof structures.

Constant Care Necessary. — In order to keep dwellings in a satisfactory condition, repairs and good care are necessary. The floors and rugs will show the marks of boots, and walls and woodwork will be scarred by furniture and hands. The exterior of a house will become weathered from the action of sun and storms. If leaks in the roof are neglected, the rain will do lasting damage to the paint, wall-paper, and furnishings within. Water from leaking pipes can do great damage in a short time. If the paint is not renewed on the exterior, the wood in places soon becomes worn and weather-stained, and begins to decay.

The Care of the Furnace. — The heating system requires constant care. The ashes should be removed from the furnace or boiler daily, so as not to burn out the grate above them. Everything should be done to keep the cellar as clean as possible, for much of the dust and dirt may be carried up into the rest of the house. Once a year, probably in the spring, after the fire is out for the season, the furnace needs to be thoroughly cleaned. It is a good practice to clean also the smoke-pipe and cold-air box. The registers in all of the rooms may be taken up and wiped out. Then it is possible to clean out the register boxes in the floor and the hot-air pipes for two or three feet. If the iron parts of the outside of the furnace have become rusty, they need to be painted. If any of the parts are broken, this is a good time to repair or replace them.

The Hot Water System. — After a time the joints of the iron pipes in the hot water and steam systems

may become loosened. Immediate repairs will save damage from the escaping water. The valves of the radiators are especially likely to wear out and need attention. Spots on the ceilings of many rooms tell the story of leaking radiators in the rooms above.

The Kitchen-Range. — A good range is one of the most important additions to a house. For the sake of appearance, and to prevent rusting, the range should be kept blacked and the nickel trimmings polished. Sometimes the fire does not burn freely. Pieces of wood and coal may have become lodged in the air-chamber between the top of the oven and the top of the stove. After removing all the covers, this space may be cleaned out with the poker and the small stove-shovel. This air-space should be kept free for the draught from the coals to the chimney. Perhaps a more thorough cleaning is necessary. Did you ever see the furnace man open the back of the stove? He has a long brush which he pushes into the air-space between the oven and the outside of the stove. As much as a hodful of ashes and cinders are sometimes removed from a range.

A Poor Draught. — Air is necessary for a fire. The stronger the draught is, the brighter the fire burns. If the kitchen fire suddenly refuses to burn well, probably the draught is checked or stopped. There may be an opening around the funnel, where it connects either with the chimney or the range. Perhaps a brick has become loosened in the chimney, and fallen down inside, stopping the opening. Perhaps the opening in the chimney has

become filled with soot and needs to be cleaned out. It is necessary to investigate the trouble, find the cause, and remedy it before the fire will burn briskly again.

The Gas-Range. — The gas-range is much simpler and easier to use and to care for than the coal-range. It also needs to be kept blacked and the nickel parts polished. The drip-pans under the burners need to be kept clean by washing and scouring. Occasionally it is advisable to take off all the removable parts and wash them thoroughly. But even a gas-range will wear out, and an old one may be improved in appearance by a coat of black paint made for iron work.

The Gas Fixtures. — Leaks in the gas fixtures are very likely to occur where burners or tubing for drop-lamps are attached. If a little thick paint is put on the burner before screwing it in, the joint will be tighter. A small leak may be temporarily stopped by rubbing on hard soap, putty, or sealing wax. The gas-key used for turning the gas on and off may work loose, and allow the gas to escape. Tightening the screw on the upper side will often stop the leak. Even small leaks should be stopped as soon as discovered. Illuminating gas of all kinds is very dangerous to breathe.

A Good Light Necessary. — With incandescent lights, after a burner is once properly adjusted and fitted with mantle, chimney, and shade, it may go a long time without readjustment. A good light properly shaded should be insisted upon for all reading and fine work. Reading in a poor light is likely to strain the eyes and may result in serious trouble.

Cleaning Fixtures. — It is desirable to keep brass jets and chandeliers clean and bright. Almost all brass gas fixtures are covered with a smooth coating of lacquer to prevent tarnishing or turning dark. Cleaning chandeliers with any scouring polish will take off the lacquer and scratch the brass. If a gas fixture has become very dark and dingy, it may be rubbed all over with emery-paper to remove all of the lacquer. Then a new coat of lacquer may be applied to the fixture. This treatment will give a clean but dull finish which, however, some prefer to the shining brass.

When a Water-Pipe Leaks. — Keeping the pipes of a house in order is of great importance. When there is only a small leak in a water-pipe, and it is desirable to keep the water turned on, a basin or pail may be set under the leak to catch the dripping water. Send for the plumber, and have the leak repaired as soon as possible. If a pipe bursts, and the water threatens to do much damage, first shut off the water at the house stop-cock, and then send for the plumber.

Thawing a Frozen Pipe. — When a pipe freezes it often bursts and makes a bad leak when thawed. When the water is frozen, any exposed parts of the pipes should be examined for unusual swellings. A slight freeze may be thawed by applying hot cloths about the pipes. Often a lighted lamp is used to heat the pipes, but great care must be taken, as many fires are caused by heating the surrounding woodwork too hot.

Cleaning the Hot Water Front. — Sometimes it is difficult to heat the water, or there may be great rum-

bling sounds in the boiler. These troubles are sometimes due to the fact that iron-rust in the water-front may partly stop the pipes. In this case the water-front must be cleaned out to remedy the trouble. Sometimes the sounds are caused by overheating the water in the boiler.

The Care of the Kitchen-Sink. — All of the tubs and basins must be kept free from lint, but the kitchen-sink usually gives the most trouble. Large amounts of fat should not be poured down the sink, but should be wiped off the pots and kettles before washing them. Once or twice a year the trap under the sink may have to be opened and cleaned. Much can be done by using plenty of hot water three times a day. A thorough washing with hot water and washing-soda should be given two or three times a week.

Cleaning Wall-Paper. — When exposed to bright sunlight, many kinds of wall-paper fade and change color. That is one reason why people pull down their window-shades. The sunlight should not be shut out of a room unless it is too bright for the eyes. Sunlight makes a room cheerful and healthful. We must learn to select for a sunny room furnishings that will hold their color, and put our more delicate furnishings in the other rooms of the house. Some wall-papers can be cleaned somewhat by rubbing them with crumbs of stale bread or Indian meal. It is more satisfactory to keep the paper clean than it is to try to clean it. Leaning against paper over registers or near radiators and windows soon soils and rubs the paper. We can never keep a

home beautiful until we learn to keep our hands off the paper, woodwork, and furnishings.

New Ceilings. — Ceilings that are whitened, calcimined, or tinted should never be wiped or rubbed. A gentle dusting away of the cobwebs is all that is possible. Trying to rub off the dark circle over the lamp or gas-jet will only result in making the ceiling look worse than before. Spots, dirt, and soot, can only be removed by washing the entire ceiling, and applying a new coat of calcimine. A papered ceiling may easily be repapered, and a painted ceiling may be washed with soap and water, or may be repainted.

Waxed Floors. — A well-waxed oak floor is a great addition to any room. It may be kept in good condition with less care than a carpet, and is more healthful. Once a year or oftener the floor should be waxed and polished, first with a weighted brush, and then with a cloth. From week to week, a polish with the weighted brush will keep the floors in fine condition. If any spots are made on a waxed floor they should be immediately wiped up with a damp cloth. Then if the places are rewaxed and polished, the spots leave no lasting effect. If water is spilled on a waxed floor, and allowed to remain, it will make a white spot. Rubbing with a warm cloth will make the spot disappear.

Varnished Floors. — In time the varnish on a floor will become scratched. The remedy is to wash the floor, remove any stains, and revarnish. Even then, some of the scratches may show through the varnish. A floor with much wear would need to be varnished once a year.

Rubber tips on the ends of the chair-legs will prevent them from scratching the floor.

Stained Floors. — Stained floors are harder to care for than those simply varnished. Stained and painted floors should be carefully watched for worn places. Before all of the varnish has worn off down to the stain or paint, these places should be retouched with varnish. If the stain or paint is also worn off, it is difficult to match the color of the floor without making a spot.

New Furniture. — The furniture as well as the rest of the room should be kept in good condition. Finger-marks may be wiped off, and the furniture then rubbed with a good polish made of equal parts of boiled linseed oil, turpentine, and Japan drier. Broken pieces need to be mended. Sometimes the boy who has studied woodworking in school can fit in a new piece, or glue in the old one. When new furniture is bought, care should be taken that it is of the same style, color, and finish as that already in the room. Buying bargains in furniture does not always produce harmonious results in a room.

New Draperies. — Curtains, draperies, and covers become shabby and worn, and must be renovated or thrown away. New ones are selected to take their place. But let us remember to buy those that harmonize in color with the other furnishings, and are appropriate. Covers and draperies for constant wear are better made of cotton that will stand washing. Brushing and airing out-of-doors will remove much dust.

New Pictures. — Good pictures are always welcome. As we grow in our love and appreciation of the beautiful,

it is fitting that our rooms or homes should express some of our thoughts. Perhaps it is fortunate that furnishings do wear out, so that we may have the opportunity to secure more beautiful ones.

A Clean House. — A healthful house must be clean. It can never be beautiful unless it is kept clean. There



A Harmoniously Furnished Room

seems to be no end of dusting, sweeping, washing, and polishing. By studying modern methods, we may learn how to keep dirt out of the house as well as how to put it out.

Dust. — One man has written a whole book on the subject of dust. The dust-pan will teach us much if we examine it after taking up the dust of a room. There may be pins, lint, thread, pieces of cloth, sand, splinters

of wood, hair, and many other things. Besides these, there is the invisible dust, cast-off skin from our bodies, and germs of some contagious diseases. The last may be living dirt, and may be ready to develop into disease when inhaled by any one. If we clean up the coarse, visible dirt we are likely to take up some of the invisible dirt, which often goes with it. That is the reason why keeping clean often means keeping well.

Places for Special Cleanliness. — While all parts of the house should be free from dust, there are some places which require extra care. The pantry and refrigerator where food is kept should at all times be free from dust, crumbs, and flies. The refrigerator needs to be washed out, dried, and aired before every new piece of ice is put in. The garbage pail is often neglected. It should be thoroughly cleaned out with hot water and soap two or three times a week. Unpleasant duties are sometimes neglected unless we form the habit of doing them.

What to use in Cleaning. — There are many preparations sold for cleaning, and it is necessary to know what to choose, and how to use it, in order to obtain the best results. In all cleaning, care must be taken not to injure the polish or the surface to be cleaned. The following list will give some suggestions for cleaning various articles:

Aluminum ware.— A non-scratching cleaning powder.

Brass.— Pipes — not lacquered — cleaning powders as Sapolio, Bristol brick. Metal polish.

Gas fixtures — lacquered — warm water and soap.

Carpets and rugs.—Sprinkle with damp paper or sawdust and sweep or brush.

Copper.—Non-scratching cleaning powders.

Enamel ware, bathtubs, etc.—Non-scratching cleaning powders.

Furniture.—Furniture polish; cloth dampened with kerosene oil.

Glass, windows, mirrors, etc.—Bon Ami and water. Water with a little ammonia. Whiting and water.

Iron.—Galvanized—cleaning powders.
Sheet—cleaning powders, stove blacking.

Mattings.—Cloth dampened in salt water.

Nickel.—Whiting and water. Warm water and a little ammonia. Metal polish.

Oil paint.—Warm water and soap or whiting; wipe dry.

Oil cloth.—Warm water and soap or borax.

Silver.—Whiting powder and water. Electro-silicon.

Tin ware.—Non-scratching powder or whiting.

Wall-paper.—Moist bread crumbs. Indian meal. Dry cloth.

Summary. — 1. Repairs are necessary to keep a house in good condition.

2. The heating plant, especially, should be kept in order to avoid fire and loss.

3. A hardwood floor should be waxed thoroughly once a year and polished weekly.

4. Cleanliness is the mark of the sanitary house.

5. Places for special cleanliness are the kitchen, the closets, and the refrigerator.

Questions. — 1. Can you find pictures of houses in America built over two hundred years ago?

2. What should you do when you smell gas?

3. How can you detect a leak in the gas-pipes?

4. What can you do when a water-pipe leaks?

5. How can a frozen water-pipe be thawed out?

6. What articles help in cleaning?

XI. SOME ENEMIES OF THE HOME

"Alcohol and effective work are incompatible."
Dr. John J. Abel.

A Danger to the Home. — The use of stimulants and narcotics is recognized as one of the greatest dangers to the home. They rob the home of money which should buy food, clothing, and shelter. They rob many homes of happiness. They rob many children of an education and a successful start in the world. Their harmful influence is so well known that some cities forbid the selling of liquors near schoolhouses and parks. In Missouri, no alcoholic beverages can be sold within five hundred feet of a public park, while in Massachusetts, none can be sold within four hundred feet of a schoolhouse.

Alcoholic Beverages. — There are many kinds of alcoholic drinks used in this country. They include wines containing from 6 to 15 per cent of alcohol, malt liquors (beer) containing from 4 to 8 per cent of alcohol, distilled liquors (whiskey and rum) containing from 25 to 50 per cent of alcohol, and alcoholic preparations sold "as tonics," "bitters," and "celery compounds." These medicinal preparations are sold in large quantities, and are used by many persons who never suspect that they contain alcohol. As a matter of fact they contain from 14 to 35 per cent of alcohol, which is more than is found in much wine and beer.

Alcohol and Health. — Good health is the working capital of every man, woman, and child. Alcohol does not promote health, and often ruins it. The continued and excessive use of alcoholic beverages produces the greatest damage to the liver, the kidneys, the heart, the blood-vessels, and the nervous system. The amount of harm done the person is in proportion to the amount of alcohol taken, and is not due to the other ingredients of the beverage. The "fine old whiskeys" are nearly as likely to produce injury as the cheaper varieties. The effect of using alcoholic drinks varies greatly, depending upon age, constitutional peculiarities, occupation, endurance, climate, and other factors.

Effect on Physical Strength. — It was once thought that the use of alcoholic drinks would make a person able to do more muscular work. The following experiments by a noted physician proves that a person using alcohol does less work. A number of soldiers were selected who were of the same age, of the same type of constitution, living under the same circumstances, and eating the same food. The men were divided into two groups, an alcoholic group which drank beer, and a non-alcoholic group which abstained from it. These two groups were set to work and watched. The alcoholic group *at first* went far ahead. They had buckets of beer at their side, and as they got a little tired they took beer, and the non-alcoholic group were, in an hour, left far behind. After a while, the energies of the beer-drinkers began to flag and before the end of the day the non-alcoholic group were far ahead.

Results of the Experiments. — When this had gone on for some days the alcoholic group begged that they might be changed into the non-alcoholic, that they might earn a little more money. To make the experiment conclusive the groups were changed and beer was given to the abstainers and withheld from the former drinkers. The results were exactly the same. The alcoholic group gained on the non-alcoholic at the start, and failed utterly towards the end of the day. This is one of the most conclusive tests to show that the use of alcohol aids physical labor *only at first*, and that a person can accomplish more without it.

Effects of Alcohol on the Brain. — The chief reason for the use of stimulants is their effect upon mental action and the emotions. Such drinks are often used at the end of the day to relieve both mental and bodily fatigue. When they are used to stimulate mental effort bad results often follow. All the evidence goes to show that no mind is capable of its best efforts when influenced by even small quantities of alcohol.

Alcohol and Character. — However men differ in regard to the physical effects of alcohol, they all agree that it has ruined the characters of a whole army of excessive drinkers. Under its influence men lose courage, ambition, and determination, and become irritable, angry, and often dangerous. Alcoholic intemperance is one of the chief causes of crime and murder. The abuse of alcohol has caused much unhappiness, misery, poverty, crime, disease, and early death.

Alcohol and Efficiency. — The effect of alcohol upon

a man's working capacity is very important as it reacts upon his home and family. Experiments have shown that a man may lose ten per cent or more in working efficiency from this cause. These tests were made in a printing-office with four typesetters. The experiment extended over four days. The first and third days were observed as normal days, no alcohol being given. On the second and fourth days each worker received a little more than one ounce of alcohol as wine.

Conclusions. — A comparison of the results of the work on normal and on alcoholic days showed no difference in the case of one of the workers. But the remaining three showed a greater or less retardation of work, amounting in one case to almost fourteen per cent. If a man could normally earn three dollars a day, a loss of fourteen per cent would mean a loss of forty-two cents. It has been the experience of many men that they habitually found it more difficult to work on Monday after an over-indulgence of the previous Sunday.

A Boy's Business Opportunity. — When a boy starts in business he finds that competition is so sharp that he needs the utmost use of all of his faculties. For the greatest success he must not be handicapped by the drinking or the smoking habit. Many business firms reject boys and young men with such habits. A boy must choose between tobacco and the place. Many railroads, employing hundreds of thousands of men, prohibit the use of intoxicants by their employees while on duty. The habitual use and frequenting of places where these are sold is sufficient cause for a man's

dismissal. Honesty, reliability, steadiness, perseverance, application, and industry are the sterling qualities that push a boy ahead. None of these characteristics are fostered by drinking or smoking.

Alcohol causes Disease. — The use of alcoholic beverages predisposes a person to disease in two ways: (1), it may be the direct cause of many diseases; (2), it may undermine the constitution so that a person is liable to take disease and to succumb more easily.

Experience of Life-Insurance Companies. — Life-insurance companies have studied for many years the effect of the moderate use of alcoholic drinks. Their careful figures and unbiased point of view may be depended upon to give accurate results. Their figures show that abstinence from alcohol increases the average chance that a person will attain long life. The records of the United Kingdom Temperance and General Provident Institution of Great Britain cover a period of forty years for both teetotalers and moderate drinkers. In former days it was supposed that an abstainer was a greater risk than a moderate drinker.

Results of their Study. — A study of the records of this company show that in forty years the temperance section had only 7487 death claims filed out of 10,463 "expected" claims; whereas among the moderate drinkers there were 12,811 death claims out of 13,514 "expected" claims. In other words the deaths among abstainers were but 71 per cent of the calculated probabilities of death; while among the moderate drinkers the deaths were 94 per cent of the calculated probabilities.

Alcohol and Long Life. — From the study of the figures of many life-insurance companies in all countries the following conclusions may be drawn. First, the excessive use of alcohol undoubtedly shortens life. Second, even a moderate amount of alcohol habitually taken tends to shorten life. Third, that total abstainers show a distinctly greater longevity than any other persons. These figures become very significant when it is known that the life-insurance companies universally reject free drinkers. In fact, forty per cent of the cases rejected are due to alcohol.

Smoking. — Smoking is another enemy that robs thousands of homes of the necessities of life. Tobacco contains a poison, which when used in excess injures the general health. It is weakening, enervating, and saps the vitality of the user. It does more than this: it causes many diseases. Irregularity of the heart, indigestion, insomnia, and cancer have ruined the life and caused the death of many smokers. Smoking often leads to the drinking of whiskey. The mouth heated by the cigar or pipe is naturally thirsty. Smoking is a great expense. A smoker often spends fifteen cents or more a day for tobacco. If he saved fifteen cents each day for a year it would amount to $54.75. This sum put at compound interest for ten years at four per cent would amount to $657.33.

Evils of Public Smoking. — The habit of smoking takes away that thoughtfulness for the comfort of others that marks the perfect gentleman. Many indulge in smoking in cars, elevators, and other public places to the

discomfort of others. Smoking has come to be a public nuisance. It is also regarded as a legal nuisance and may be regulated or prohibited without interfering with the right to smoke in private. The "No Smoking" signs should be made more effective. Some cities have already adopted an ordinance prohibiting the practise of smoking on street cars, classing it as "a most vile and objectionable custom to a majority of our citizens."

Effect of Smoking on Young Men. — Tobacco stunts growing youths both mentally and physically. The amount of interference with growth has been measured in several classes in college. One class was divided into three groups: first, those who used no tobacco; second, those who had used tobacco regularly for one year; and third, those who used it only occasionally. At the end of three and one half years it was found that the non-users had increased in weight ten per cent more than the regular users, and six per cent more than the occasional users. All scientists are agreed that smoking by young men and boys is injurious. As a rule the non-smoker is mentally and usually physically superior to both the occasional and the habitual smoker. Of the students who entered Yale during one year, the smokers were fifteen months older than the non-smokers. The use of tobacco by young men is closely associated with idleness, and lack of application and ambition.

The Cigarette Habit. — The cigarette is a popular form of tobacco especially among boys. About nine billion cigarettes are smoked in this country every year. This means about three thousand smokes a year for each

man and boy or nearly ten cigarettes a day. This habit is so universally acknowledged to be especially injurious that eight states have passed laws against the manufacture or sale of cigarettes. Occasional smoking often creates a desire for the habitual cigarette. No boy who smokes can be as healthful, as intelligent, as high in moral aim, or as successful as he would be if he let tobacco alone. When John B. Gough, the great reformer, gave up tobacco, he said, "You are a *weed*, and I am a *man*. I'll master you if I die for it." He did master it.

Summary. — 1. Alcoholic beverages affect those who use them physically, mentally, and morally.

2. While stimulants seem, at first, to increase physical strength, in the end, they lessen it.

3. The chief reason for the use of stimulants is their effect upon the mental and emotional faculties.

4. The abuse of alcohol has caused much unhappiness, misery, poverty, and crime.

5. Smoking is especially injurious to boys since it stunts their growth.

6. Our greatest glory is not in never falling, but in rising every time we fall. — CONFUCIUS.

Questions. — 1. How does the use of stimulants and narcotics affect the home?

2. How do stimulants affect a man's working efficiency?

3. How have the life-insurance companies shown that abstainers live longer than those who use alcoholic drinks?

4. How does the use of alcohol predispose a person to disease?

5. How is smoking an enemy to the home?

6. How does smoking interfere with a boy's opportunity in business?

FOR THE HONOR AND GLORY OF OUR HOMES

Let us not injure, in any way, any tree, shrub, or lawn.
Let us not cut or mark in any way, fences, poles, sidewalks, or buildings of any kind.
Let us live in fresh air.
Let us sleep every night with a window open.
Let us always read by a good light.
Let us help to keep our homes clean and orderly.
Let us be sure that the wastes of the house are removed quickly and in a sanitary manner.
Let us always keep our back yards as clean and beautiful as we keep our front lawns.
Let us eat simple and well-cooked food.
Let us drink pure water.
Let us not spit upon the sidewalks, street-crossings, or upon the floor of any street-car, schoolhouse, or other public place.
Let us never throw papers or rubbish into the streets.
Let us at all times respect the property of others as we would our own.
Thus shall we become good and useful citizens, making our homes healthful, our city sanitary, our state beautiful, and our country illustrious.

XII THE HEALTHFUL CITY

"On these municipal questions let there be light, not heat." — *Lyman Abbott.*

The Successful City. — In order that a city shall increase in size and area, it is necessary that the manufactures, industries, and other occupations shall be sufficient to support the inhabitants. In addition, people must be able to live hygienically and happily within easy reach of their work.

A Desirable City. — A city, to be desirable as a place of residence, must offer inducements to attract capital, industries, and people. A city should be sanitary, safe, and beautiful — three necessary requirements.

A Sanitary City. — The most important inducement that a city can offer is healthfulness. We are beginning to recognize that this is of prime importance. Cities of the future must secure for their residents the three essentials of health, namely: pure water, pure air, and pure food.

Pure Water. — Many American cities already have a safe supply of water. Others are now spending millions of dollars to secure a clean supply for the future. Some cities have not realized, as yet, the value or the necessity of safe water. Many American towns have still no public water-supply. Among the most notable sanitary improvements during the last ten years,

is the development of water-works extending over thousands of acres and costing millions of dollars.

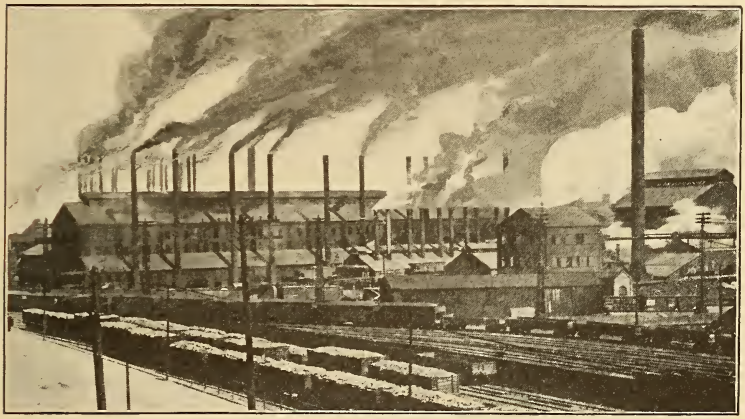
Pure City Air. — Probably the next ten years will see a great advance in securing for cities clear fresh air. Public opinion will need to be aroused to demand that we have, both out-of-doors and indoors, this greatest necessity of life. Many persons today are unable to detect foul air, and seem unconscious of the fact that they are slowly but surely being poisoned by it.

Out-of-Doors. — Every effort should be made to secure breathing-spaces in the midst of cities. Wide streets, squares, and parks are great helps in admitting air and sunshine between tall buildings. Small playgrounds in different sections have proved a blessing and pleasure to the children and mothers. Great advance has been made during the last few years in providing cities with sewage systems and a satisfactory method of disposing of waste material. Odors and decaying matter are a menace to health, especially in warm weather, and impair the life-giving value of fresh air.

City Cleanliness and Fresh Air. — Cleanliness in all the highways and byways of a city will help in keeping the air fresh and free from odors. Waste-paper, rags, and refuse should never be tolerated in streets, alleys, yards, vacant lots, fire-escapes, and balconies. That menace to health, the dump, should not be allowed near city dwellings nor within sight of a country highway. The good results obtained by every effort for more air in cities are too often offset by soot from soft coal and by bad odors from manufacturing plants. In many cities,

establishments producing disagreeable odors are obliged to locate in the outlying districts.

The Source of Smoke. — Every tall chimney when sending forth volumes of black smoke, is a menace to health. Locomotives, factories, power-houses, and all large buildings, like hotels, schoolhouses, churches,



THE SMOKE NUISANCE

theatres, and stores add their share toward making the air of cities hazy and dim.

Damage Done by Smoke. — The damage from smoke is visible on every hand in a city using much soft coal. Smoke injures the foliage of trees and all plant life in the parks and streets. It attacks the exterior of buildings, even those of granite, and makes them black and rough. It injures the delicate human lungs, making them weaker, so that they are more likely to yield to diseases. Smoke does damage which cannot be repaired to clothing, books, furniture, and pictures.

Smokeless Chimneys. — Several cities have already solved the problem and cleared their skies of smoke. Sometimes a smokeless fuel, as natural gas or hard coal, has been substituted for soft coal with excellent results. Perhaps electricity will one day be used. But the greatest results have been obtained by enforcing laws requiring proper firing and the use of smoke-consumers.

Reducing the Smoke. — To burn soft coal without smoke a smoke-appliance or reducer is used, and proper burning or firing of the coal is necessary. In one city the inspector takes a photograph of any considerable volume of smoke coming from a chimney, and compares it with a series of six charts as a standard. The first chart shows no smoke, and the others volumes of smoke increasing in blackness. The owner is pronounced "passed," or "warned" to comply with the regulations, according to the results of the comparison of the photograph of his chimney with the standards.

Smoke Unnecessary. — It has been proved in several cities, that it is possible to run boilers without great volumes of black smoke, and with a saving of fuel. Public opinion must be brought to bear on the problem in order that cities may have clear skies.

Ventilation in Public Places. — We little realize what a vast improvement it would be if all places of business, factories, offices, and stores were supplied with fresh air. A ride in a close, hot car may make one feel unfit for a long, hard day's work. The enjoyment of attending a theatre or church is often spoiled by the deadening effects of close air. A little inconvenience from a

draught of fresh air is better than enduring foul air. Let us insist upon having the ventilators open in cars and in other public places.

Fresh Air in Schools. — Educators are beginning to realize the amount of good that fresh air will do sick children. Fresh air schools have been established in



A Fresh Air School

Providence, Boston, Philadelphia, and other cities for children that are sick and delicate. These schools are held out-of-doors the year round and produce a great improvement in the children. Perhaps some day the well children also will be supplied with pure air.

The Noise of the City. — Another drain upon the nerve force of city dwellers is the noise. From morning till night, and from night till morning, there is a steady hum and buzz in the heart of a great city. Probably

the whistles of the locomotives and factories are the loudest and most irritating sounds. Only one who has lived near a freight-yard or station can realize the amount of whistling, backing, and starting that goes on at night. In a factory city, the factory whistle becomes a source of torture at six and seven o'clock in the morning and at other times during the day. Here a gong could give notice of the beginning of work to those in the vicinity. Most workers live too far from the factory, today, to profit by the six o'clock whistle. Noise is especially harmful to the sick.

Other Causes. — Any one who has lived in a great city can name many other sources of noise. The heavy traffic in the streets adds the sounds of hoofs and wheels. Motor-trucks and carriages make the streets resound with their chug-chug or their shrill horns. The trolley-cars and elevated trains are only equaled by the steam-cars in creating a thundering sound in their immediate neighborhoods. The fire-alarm bell in many cities is still a survivor of the bell of the village church, which must ring loud and long to bring every man and boy to the scene of the fire. In modern cities, the electric system and the telephone is much more efficient. The fire-engines and fire-automobiles, however, must always announce themselves.

Street Sounds. — The street-pedler or huckster is probably one of the greatest obstacles to a quiet street. By bells, calls, and horns he announces his wares. Much can be done in restricting the wandering brass-bands, hurdy-gurdies, and hand-organs. In one city

it is the duty of the music commissioner to see that the instruments of street-musicians are in tune before giving them licenses to play in the streets. The screaming of children playing in the streets is often a great source of annoyance to neighbors.

The Effect of Noise on Health. — Noise has a distinct effect upon health. Constant and loud noises will, in time, make a person hard of hearing or totally deaf. The hearing of men engaged in making boilers often becomes very much impaired from the great noise. With some persons, noise wearies the nerves and brain so that permanent harm may result. If proper rest is obtained at night, the body has the power of recovering, and after a time becomes accustomed to a certain amount of noise. The sounds of the city become so habitual to some, that when they go into the country they are unable at first to sleep on account of the extreme quiet.

How to Reduce the City Noise. — It is needful to distinguish between the noise that is necessary and that which is unnecessary. At best, a city is a noisy place, and much care must be exercised to suppress thoughtless and careless sounds. Two ways have been found successful, the passing of laws and their enforcement, and the work of societies in arousing a public interest in the matter.

Prevention by Law. — A beginning has already been made in regulating noise by city laws or ordinances. The carting of iron pipes through one city's streets is forbidden, unless the pipes are wrapped. A successful crusade has been made against whistles in Detroit,

Chicago, New York, and Cleveland. The shouting of newsboys and hucksters has been stopped in other cities. One city makes it unlawful to permit any loud sounding instrument like the phonograph to be played into a street or any public place.

Results in New York. — As so often happens, pioneer work in the improvement of towns and cities has been done by public-spirited individuals or a society formed for the purpose. One of the hardest fights for the suppression of noise has been fought in the city of New York. This city is so situated that it is surrounded on all sides by deep waters, the Harlem River, the East River, the Hudson River, and New York Harbor. In all of these waters steamboats, ferries, tugs, and other craft are plying back and forth. The noise from the shrieking whistles was not only annoying but distressing, and much of it was unnecessary. Mrs. Isaac L. Rice started the crusade for its suppression. After appealing to many of the departments of the city government, she found that they had no authority to stop the disturbance since the Hudson River is a federal highway. Then she carried her case to the United States Government at Washington and appealed to several departments. None of them had the power to help her. Finally the Bennet bill was introduced, and passed in Congress. As a result eighty-five per cent of the unnecessary noise has been suppressed.

Work of a Society. — To awaken public sentiment in New York, the Society for the Suppression of Unnecessary Noise was formed. Mrs. Rice was made presi-

dent, and many distinguished men and women lent their support. The chief work of this society has been to enforce a "quiet zone" about hospitals, and to form a "Children's Hospital Branch." Keeping heavy traffic and unnecessary noise from the neighborhood of hospitals has been a great boon to many sick persons. In the "Children's Hospital Branch," thousands of children have promised not to make a noise near a hospital. The following is one of the pledges which the children wrote in their own words: "I offer up this sacrifice, so as to comfort the sick near a hospital and any place I know where sick persons are, and to prevent all sorts of noise that are not necessary." In other cities societies have been started to suppress street-noises.

The Noisy Fourth of July. — The noisiest day of all the year is the Fourth of July. Formerly the "night before the Fourth" was made hideous with bonfires, tin horns, and shouting. Sunrise on the glorious day was hailed with fire-crackers, cannon-crackers, the ringing of bells, and many boyish pranks. A parade of horribles kept up the excitement. Noon was announced by more ringing of bells and fire-crackers. The setting of the sun was the occasion for more noise. To many the fireworks of the evening were the crowning feature of the day.

Accidents. — The celebration in many respects was like a great battle: first came the noise of roaring fire-arms, then the burial of the dead, and finally the care of the wounded. We usually think that large numbers are killed in battles. The following table compares the

number killed and wounded in some of the battles of the Revolution and on each Fourth of July. There are twelve times as many killed and wounded each Fourth of July as there were in the battle of Bunker Hill. This is all the more terrible because it is unnecessary, and sacrifices the lives of children. The most deadly causes of accident are the blank cartridges, fire-crackers and fire-works. It is hardly necessary to name the numbers of those who are made blind or who lose a leg, an arm, or a finger.

Battles	*Killed and Wounded*	*Celebrations*	*Killed and Wounded*
Lexington	83	July 4, 1903	4,449
Bunker Hill	449	July 4, 1904	4,169
Fort Moultrie	37	July 4, 1905	5,176
White Plains	100	July 4, 1906	5,466
Fort Washington	149	July 4, 1907	4,413
Monmouth	229	July 4, 1908	5,623
Cowpens	72	July 4, 1909	5,307
	1,119		34,603

The Safe and Sane Fourth. — The celebration of this holiday was becoming so dangerous in large cities that a few persons became aroused by it. As early as 1903 the danger from firearms was recognized, and a movement started against their free use. A few years later Mrs. Isaac L. Rice sent an appeal to the Governor of every state in the Union and to the President of every college for co-operation in the work of stopping the slaughter. A hearty response was received. The magazines and newspapers have furthered the cause. Many prominent citizens have become interested, and

have given much time and work in planning city programs to take the place of the time-honored celebrations.

The New Fourth of July. — New York, Cleveland, Springfield, Washington, and other cities have already succeeded in celebrating the Fourth in an interesting, enjoyable, and safe way. The most attractive programs include sports, fire-works, processions, ball games, historic pageants, band concerts, and folk-games. The children take an active part, and enjoy the day. New York, the largest city in the country, has made the day pleasurable by instituting games and fire-works in forty-one parks and squares. Cleveland was the first large city to adopt extreme measures. It has prohibited the sale, use, and possession of fire-crackers, toy pistols, and fire-works of any kind within the limits of the city. A great parade including the children is the chief feature of the day. Prizes and medals are awarded for the most interesting floats and unique costumes. As a result, there have been no deaths. It has been amply shown that the Fourth can be enjoyed without loss of life. Many other cities have adopted the safe and sane way of celebrating the Fourth of July.

The Safe City. — A city should not only be sanitary and protected from disease, but should also be a safe place for persons and property. The citizen must be protected from fires and from accidents of all kinds. In many of the city fires lives are lost as well as millions of dollars worth of property destroyed. Persons living in a city should be reasonably safe from accidents of all

kinds. Every year there are more than eight thousand killed in railroad accidents. To this number must be added two thousand more killed by horses and vehicles and nearly two thousand by street-cars. Even then, this makes only a part of the enormous numbers accidentally killed, yearly, in the United States.

Safe Streets. — The streets and sidewalks of a city must be kept in good condition. In summer, the streets must be cleaned, oiled, or watered, and sidewalks must be swept. In winter, snow must be removed from streets, sidewalks, and sometimes from the roofs of houses. Icy and slippery pavements must be made safe for horses and men by sprinkling them with sand. The police must see that there is no disorderly conduct on the streets, and that children can pass with safety. An efficient police force can do much in preventing thefts, robberies, and assaults. The street-crossings must be kept free, and the rights of foot-passengers respected.

Danger from the Automobile. — It has been necessary to protect the public from accidents by automobiles. So many of these are fatal that there are in the United States two deaths from this cause for every day in the year. Laws have been passed, and in some places are rigidly enforced, regulating the motor traffic. The license to drive, the registered number, the rate of speed, the lights at night, the places for driving, and other matters are subject to law. Cities derive an income from the fines imposed for violation of these laws.

The Meaning of Civic Beauty. — The general appearance of a city depends upon the streets, the buildings,

the vacant land, and the parks. The general plan of the streets, their width, direction, grades, and good repair are important. The kinds and condition of the fences, poles, and trees often indicate the character of the streets. The sizes and shapes of the buildings, as well as their location, are also important. A well-



Lake Shore Drive, Lincoln Park, Chicago

built and attractive residence street has houses of approximately the same height and value, but differing enough in detail to make variety in its appearance. A city cannot be made beautiful after it is entirely built. A city must grow beautiful. As new streets are built, and new public buildings are erected, they should be stately and imposing and an ornament to the city. The useful and the beautiful must go together. Each city should take pride in preserving for the public any special

advantage of location that it may possess. A fine river, a commanding ocean-view or front, beautiful hills or mountains, or a wide lake-front may be developed, and become a city's most precious possession.

The Economic Value of Civic Beauty. — The great cities of America have discovered that it pays in dollars and cents to be attractive. This is shown by the establishment, everywhere, of parks and driveways, and the erection of fine municipal buildings, such as the public libraries of New York, Boston, and St. Louis, and the city halls of New York, Philadephia, and other large cities. People of wealth and culture are attracted to a city of fine, well-kept streets, parks, and public buildings. Manufactures and other industries are more likely to locate where their employees may live happy, as well as busy, lives. Visitors for sight-seeing and conventions bring business and money to the city of comfort and attractions.

Work for Civic Beauty. — The work for more beautiful cities has been conducted on two general lines. First, the suppression of all those features that make a city unattractive and unpleasant has been pushed vigorously. The regulation of unsightly signs and billboards, the removal of overhead wires from streets, and improved street-paving and lighting, have been accomplished in some of the most progressive cities.

Other Results. — More positive work also has been accomplished. The new buildings, bridges, street lamps, and all structures erected by the city have been more decorative. Many of these have been enriched by

mural paintings, stained glass, statues, bas-reliefs, monuments, fountains, and arches. The Municipal Art Department is coming to be recognized as a necessary part of the government. Art Commissions are appointed to aid the city in passing judgment upon all matters



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WASHINGTON MEMORIAL ARCH
Washington Square, New York

pertaining to the subject, so that only works of value shall find a permanent place before the public.

Billboards. — One of the greatest obstacles in making a city attractive is the presence of huge signs and unsightly billboards. They stand on nearly all the vacant lots in a city, as well as on land extending along the highway or railroad-track in the open country. Some of the finest roads leading to the suburbs of cities are lined

by billboards covered with advertisements in letters and figures of huge proportion. They shut from sight beautiful views, stately buildings, fine parks, and boulevards that have been constructed to adorn the city at an immense cost.

Their Extent and Value. — It would be difficult to arrive at a correct estimate of the extent of billboards in this country. A few figures, however, will give some idea of it. In St. Louis alone in February, 1909, there were about one million and a half square feet under the control of companies and theatres. The total value of this property amounted to $140,000 giving an income of at least $450,000 yearly. In Chicago one company alone has 1,800,000 square feet of billboards. In Cincinnati there are about 3,000,000 square feet. The income from rents varies according to the location from twenty-five cents to six dollars for each square foot.

Use of Billboards. — By the study of advertisements in one city it was found that merchandize of many kinds and theatre notices formed the chief subjects. Of the entire billboard surface, 11 per cent was devoted to liquor, 10 per cent to tobacco, 9 per cent to theatre notices, and 8 per cent to food. The billboards compete with the daily press in reaching the eye of the public.

Reasons for Complaint. — With their increasing demands, billboards have come to be a menace to public health, safety, and morals. They are a menace to health since the space behind them is likely to become a public dump and a meeting place for tramps. They

are dangerous to the public safety if not properly built and located. When built of wood they aid in spreading fires. Pictures of crime which are often depicted are injurious to the morals of the young.

How to Restrict Billboards. — Successful results have been accomplished along four lines of action, namely: by control by the police powers of the State, by taxation, by prosecution for trespass, and by boycotting the advertised articles. Some cities already tax the boards from one to twelve cents for each square foot, thus securing thousands of dollars for the city treasury. It has been found that frequently billboards have been erected without the knowledge of the owners of the land. This is a trespass upon the land and may be punished. Much can be done in arousing public spirit against the articles so advertised.

Results Obtained. — Laws have already been enacted in connection with the building laws in several cities, but the greatest difficulty has been to enforce them. These laws restrict the height of the billboards, their length, their distance from the street, and the size of printing upon them. Regulations are now in force in many of the larger cities.

How to Prohibit Signboards. — In New York State, automobile clubs have started a movement for the removal of advertising signs along the roadside. The Automobile Club of America has put up more than twenty thousand signs and guide-posts indicating the direction, distance, crossings, and curves of the road. The value of these has been greatly lessened since they have been

nearly concealed by the ever present advertising sign. As a result a bill was passed in the New York legislature which prohibits the displacement or injury of mile-boards and guide-posts within a public highway. It also prohibits the placing of commercial advertisements on stones, trees, fences, and buildings without the consent of the owner, and prohibits entirely such signs within the public highway. A person who violates this law may be punished, and the signs may be taken down by any one. Since the passing of this bill the automobile clubs have been active in removing the illegal signs along the roadsides.

Summary. — 1. A city should be sanitary, safe, and beautiful.

2. Clean fresh air is a vital necessity in crowded cities.

3. Smoke can be suppressed by means of smoke-reducers and well-enforced laws.

4. Health demands that all unnecessary noise of a city shall be silenced.

5. The appearance of the streets, the buildings, and the parks are the chief features in making a city beautiful.

6. Billboards are a menace to the safety and the health of the public, and a blot upon the American city.

Questions. — 1. What must a city have in order to be sanitary?

2. How may city air be made clean and wholesome?

3. How have children helped to stop or lessen unnecessary noise? How can you help?

4. What is the need of a safe city?

5. What have you seen that adds to the good appearance or beauty of a street? What injures the appearance of a street?

6. How have the billboards been regulated?

XIII. THE PARKS AND PLAYGROUNDS

If any round about me play,
And dance and sing in glad array,
And laugh and cheer,
May it be mine to see and hear.
John Kendrick Bangs.

The Necessity for Parks and Playgrounds. — The establishment of parks and playgrounds in all the large cities, and in many smaller ones, proves that the public has felt the need of them. Where houses are built close together, men and women, as well as children, require some place where they can enjoy fresh air, sunshine, and the green grass. Recreation or play is a necessity for every one. The children chiefly enjoy the playgrounds, while the entire family may profit by trips to the woods, the lake, the river, or the seashore of the parks.

The Value of a Park. — The real value of a park depends largely upon two conditions. Of first importance is the location and size. A park should be located near a thickly settled district, or be easily and cheaply reached by trolley, steam-car, or ferry. In a city park a band concert will entertain thousands, and the number is only limited by the amount of standing room. Of second importance is the selection of the kind of park that the residents of a district or a city are best able to enjoy. In the heart of a great city a park fitted up partly as

a playground is more valuable than merely a stretch of green grass, without regard to the size or the expense.

Kinds of Parks. — The parks found in the thickly settled districts are usually small in area, but are much enjoyed by those living in the neighborhood. Many cities are developing large parks situated in the outskirts or suburbs. Boulevards or very wide parklike streets



Boulevard on the Bank of a Stream

are popular with those who drive. The parks of a city when connected by boulevards are usually spoken of as a park system.

City Squares. — When two or more streets meet they often form an open space, called a square, a triangle, or a circle, according to its shape. Sometimes these spaces are left merely as large open areas with no adornment. Often an ornamental lamp-post rises from an enlarged base or an isle of safety, and lights the entire

space. Some squares are large enough to be planted with grass and shrubbery, and serve as a pleasant out-of-doors resting place in the summer. Fountains and statuary often adorn these areas. In the city of Washington small squares add much to its attractiveness. In that city there are two hundred and seventy-five



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In Central Park, New York

green spots less than an acre in extent. Thirty-one of these are adorned by the statue of a president, a general, or some other distinguished American.

City Parks. — Some cities have large parks located within the thickly settled area. In Chicago, the beautiful Humbolt Park, Garfield Park, Douglas Park, and Washington Park are surrounded by the homes of thousands of citizens. The three parks on the lake-front, Lincoln, Grant, and Jackson Parks, are situated farther

from those who most need them. In the heart of New York City, Central Park, containing over eight hundred acres, is the chief spot of natural beauty. In the city below this point twenty-six small parks, ranging in size from one to twenty-one acres, serve as breathing-places. Above Central Park in Manhattan there are seven large parks. Part of the water-front along the Hudson River is preserved in Riverside and Washington Parks, with grand views of the river and the palisades on the opposite shore.

Parks in Philadelphia. — The chief value of the parks in Philadelphia is that they are located within easy reach of the residents. There are six large parks, four of which extend along the valleys of streams that flow into the Delaware River. Of these, Fairmount Park is one of the largest in the country and one of the most beautiful. It contains over three thousand acres, and is reached by trolley-lines, one of which extends into the park and carries thousands of pleasure seekers. In addition there are seventy-four smaller parks located throughout the city in nearly every ward.

The Boston Parks. — It is said that the best park system in the world is that of Boston and its suburbs. It is both large in area and so located as to be within easy reach. The city squares and playgrounds are scattered throughout the thickly settled districts. The city parks and boulevards make a nearly complete circle from the Common in the heart of the city, through Franklin Park in Roxbury, to the Marine Park in South Boston. The Common is interesting as being the

oldest public park in the heart of an American city. Boston Common dates from 1634, four years after the settlement of the town. It was laid out as "a place for a trayning field" and for "the feeding of cattell." Its forty-eight acres include rolling green fields separated by wide paths which are bordered by fine old trees.



The Boston Public Garden

Large Parks. — Some of the largest municipal parks in America are located on the borders of cities or even beyond their limits. Such parks are not as useful as those within the heart of a city. Los Angeles and Kansas City have large parks near the city limits. Baltimore has four large parks situated at the four corners of the city. One of these, Druid Hill Park, is among the most famous in the country. The care of it as a

private park for one hundred years has produced most beautiful lawns and trees. In St. Louis, Forest Park, the World's Fair Ground, is the largest park, and will be preserved in its natural beauty.



Abraham Lincoln Statue by St. Gaudens in Lincoln Park

The Park System of Chicago. — The park system of Chicago is one of the most complete and extensive in this country. It consists of seven large parks, five smaller parks, and forty miles of boulevard connecting the parks and forming nearly a complete circle. The different ways in which the several parks have been developed are interesting. Jackson Park was the seat of the World's Fair, and still retains many lagoons which are suitable for boating. Douglas Park contains a summer swimming pool, bathhouse, an open-air gymnasium, and a playground. Garfield Park possesses a great athletic field and track. In Lincoln Park, on the lake shore, are the zoölogical gardens and the chief sculptural decorations of the city, St. Gaudens' statue of Lincoln and the Grant monument.

County Parks. — The foremost county park system in America is in Essex County, New Jersey. This contains three large reservations, six parks, and connecting parkways, some of which are still to be built. The South Mountain Reservation is noted for its beautiful mountain scenery, its waterfalls, and its forests.



A Well Kept Park

Eagle Rock Reservation contains a high and famous cliff, Eagle Rock, six hundred feet above tide-water. From this point wonderful views may be obtained of town, country, and river. It is said that it looks upon more homes and varied industries than any other natural elevation in the world.

Need of Playgrounds. — Play is necessary for every child to develop muscle, brain, and character. A walk

through the city will show the great danger to which children are exposed while playing in the streets. The large number of accidents from this source proves that city children should have some place in which to play, near their homes, besides the streets.

Meeting the Need. — The demand for space in which to play is so urgent in many places that cities are establishing playgrounds or are taking charge of those already started by public-spirited individuals or societies. Within two years two hundred and fifty cities in the United States have opened playgrounds for the first time. In two hundred other cities there is a strong movement for their establishment.

Maintaining Playgrounds. — In large cities there are many agencies maintaining playgrounds, including the park department, the board of education, settlement houses, and various associations.

PLAYGROUND CENSUS

City	*Population*	*Number of Playgrounds*
New York	4,766,883	261
Chicago	2,185,283	29
Philadelphia	1,549,008	73
St. Louis	687,029	11
Boston	670,585	77
Cleveland	560,663	15
Baltimore	558,485	50
Buffalo	423,715	8
Cincinnati	364,463	12
San Francisco	416,912	5
Pittsburgh	533,905	28
Detroit	465,766	11
Washington, D.C.	331,069	32
Los Angeles	319,198	9

Where City Children Play. — Besides the city streets, the city squares or triangles offer a small area for jumping rope, playing marbles, and such games as require only a small amount of space. City parks may become the ideal places for children to play, when they are fitted up, like those in Chicago, as playgrounds and



A Playground in Chicago

athletic fields. Although the backyards of tenement houses are often small and untidy in appearance, they serve many children as spaces for play. In some cities the backyards of several neighboring houses are made into a common playground for the children living in those houses. Vacant lots are often used by the larger boys for base ball and foot ball, and so are hardly safe places for the little children.

School-yards. — School-yards were formerly closed to children after school hours. In some cities the yards are now fitted with swings, parallel bars, and other apparatus. They are open after school, on Saturdays, holidays, and daily during the summer vacation. Phila-



A Playground on the Roof

delphia has fifty-six playgrounds in school-yards and Boston has fifty-four.

Roofs of School Houses. — Where school houses have no yards, the roofs may be fitted up for basket-ball or for other recreation. In New York City, where land is very valuable, the roofs of eleven public schools are used as playgrounds. They are thrown open every evening, except Sunday, from 7.30 to 10 P.M. The boys have active games and gymnastics, and the girls dance to the

music of brass-bands. The average nightly attendance at each of these roof playgrounds is about two thousand, including many adults.

Playgrounds. — Well-equipped playgrounds have been established in city parks and squares. In a thickly settled district the entire park may be given up to a playground as in the McKinley Park in Chicago. More often the playground is an area set apart for the children in a large park, as the playgrounds in the De Witt Clinton and the Hamilton Fish Parks in New York, and in the Charlesbank in Boston.

The Equipment. — A playground is often divided into the athletic field for boys and men, and the playground proper for girls and the smaller children. The boys' playground often contains an outdoor gymnasium, a running track, basket-ball courts, giant stride, slides, and space for games. The girls' playground may contain large swings, small swings, sand-boxes, volley-ball court, seesaws, slides, teeter ladders, and space for games. Shelters are usually provided, and some planting of trees and shrubs makes the surroundings more attractive. A shallow pool for wading and a drinking fountain are two popular attractions.

Notable Playgrounds. — The most notable single provision for playgrounds ever made by any American city was recently provided by the South Park Commission of Chicago. Fourteen recreation centers were established in as many parks on the south side of Chicago. Each center includes a club house, an athletic field, a playground, a wading pool, a swimming pool, a bath-

house, and outdoor and indoor gymnasiums. Each clubhouse has an assembly hall for free social gatherings, smaller rooms for club meetings, and reading rooms. The restaurants furnish substantial food at the popular price of five cents a dish. The average cost of maintaining each center is $2500 to $3000. These centers are helping to solve the problem of Chicago by making playgrounds more accessible. One of the most important features is the practice of flooding the playgrounds in winter. In Chicago as many as two hundred skating rinks are available by flooding and lighting vacant lots.

Establishment by Law. — Playgrounds have been maintained in Massachusetts since 1872. The public have become accustomed to seeing them and reading about them. They have learned their value by actual experience. In 1908, Massachusetts, as a state, made a most noteworthy advance in the cause of playgrounds. A law was passed that every city or town in the state having a population of ten thousand "accepting the provisions of this act shall . . . provide and maintain at least one public playground . . . for the recreation and physical education of the minors of such city or town." Since that time much work has been done in educating the people through public meetings, pamphlets, newspapers, and local clubs. As a result, many cities and towns have accepted the provisions of the playground act.

Public Baths. — Public baths are both a protection of the public health and a popular recreation. Many baths are open the year round, and are located in the

same building as gymnasiums or swimming pools. Probably the most extensive system of baths in the United States is in Boston. It is said that the L Street bath was the first free municipal bath of any kind established in the United States, and it is still the most popular. During 1910, in Boston, there were over



A Wading Pool

thirty-six thousand regular patrons of the all-the-year municipal baths.

Recreation Piers. — Those American cities that are located on the ocean or on a great lake have hardly begun to realize the possibilities of recreation piers for fresh air and pleasure. Usually seats are provided where men and women may read, rest, and talk. There is usually enough space for the children to play quiet games. New York City has nine public piers located

on the North and East Rivers. Even the second story of a pier may be utilized while business is being conducted below. Philadelphia has developed her recreation piers at the foot of Chestnut and Race Streets. In Chicago, the sanitariums in Lincoln Park and Jackson Park give an opportunity to enjoy the breeze that is seldom lacking on the lake shore. The large pier in Jackson Park where fishing is allowed is enjoyed by thousands throughout the summer.

Summary. — 1. The real value of a park depends upon its size, location, and the way in which it meets the needs of the neighborhood.

2. Chicago, New York, Philadelphia, and Boston are well-supplied with parks.

3. Parks, boulevards, and sometimes city squares form a park system.

4. Playgrounds may be located in parks and squares, in yards of schools and dwelling houses, or on the roofs of buildings.

5. The Chicago recreation centers are the most noteworthy playgrounds in America.

6. In Massachusetts, the playground act sets the example for other states in establishing playgrounds.

Questions. — 1. What city squares do you know? What do they contain?

2. What large park is nearest your home? What makes it beautiful? How often do you visit it?

3. Can you find a map or plan of the park system of the nearest large city?

4. Have you any pictures of famous parks in other cities? Can you find some?

5. What have you done or seen other children do on the playground? What do you like to do best?

6. How many playgrounds are there in the city or town where you live? Who maintains them?

XIV. THE CITY FOOD SUPPLY

Plain food is quite enough for me. — *Oliver Wendell Holmes.*

The Source of Supply. — The United States draws part of its supply of food from many foreign countries. Great ocean steamers laden with food products enter our ports. Some bring tea, coffee, dates, and figs from the far East. Some are laden with sugar, molasses, bananas, rice, cocoa, and coffee from the South. Still others bear cheese, olive oil, olives, barley, macaroni, and lemons from European countries.

Food Produced in the United States. — A large amount of the food used in the United States is grown or manufactured in this country. Most of the meat and meat products, such as canned and dried meat, are raised and prepared in the central and southwestern states. The value of the products of the slaughtering and meat packing industries in the United States amounts to over eight hundred million dollars a year.

The Fish Supply. — Fish is caught on the Atlantic and Pacific coasts and on the Great Lakes. Fresh fish is now sent by refrigeration long distances to inland cities. Fish is also prepared by drying, pickling, smoking, and canning, and sent to every village of the country.

Cereals. — The cereals, including corn, oats, wheat, barley, buckwheat, and rye are very important foods. They are grown chiefly in the central and north-central regions of the United States.

Vegetables. — Many of the fresh vegetables sold in a large city are raised in market gardens within ten or fifteen miles of the city. The raising of winter vegetables may form the chief industry of a region. Potatoes from Maine, onions from Bridgeport, and cranberries from Cape Cod are known all over the country. Much of the early supply of spring vegetables, as asparagus and kale, is shipped from the southern states. Many delicacies, like strawberries, arrive from Florida while the snow is still on the ground in the North.

Where the Fruit is Raised. — Fruit is raised in many sections of the United States. The greatest fruit states, however, are on the Pacific coast and in the middle west. California raises twenty-one per cent of the entire fruit crop of the United States.

Where the Nuts Grow. — Cultivating nuts is much less general than raising fruits. The states raising the most valuable nut crops are California, Pennsylvania, Texas, New York, and Louisiana. Peanuts are probably the best known and most universally used. They are not true nuts, but pods, and grow underground on bushes about one foot high. The annual crop is worth ten and one half millions of dollars, and one half of it is produced in Virginia and North Carolina.

Prepared Food. — A large amount of food in the market is prepared so that it will keep a long time. Much of it is put up in glass bottles, tin cans, wooden boxes, or paper packages. The chief object is to keep the food from decaying. The covering also keeps the food clean, and makes handling and selling much easier.

The foods most usually prepared in this way are meat products, vegetables, fruits, and fish. Foods are prepared in many ways. Drying, salting, pickling, smoking, and sterilizing will preserve food. We little realize what quantities of prepared food are sold, and that the amount is still increasing. Something like one



A California Orange Grove

hundred million cans of corn, about the same number of cans of peas, and one hundred and fifty million cans of tomatoes alone are packed yearly in the United States.

Fresh Food. — There are many kinds of food that must be kept fresh and delivered in perfect condition. Immense amounts of meat and fish are handled daily. Many winter vegetables may be stored in various ways until needed, and are then delivered fresh. Apples, oranges, lemons, dates, prunes, and bananas are kept

fresh, and delivered nearly every month of the year to every city in the land.

Transportation. — Many of our foods have traveled halfway or entirely across the continent. The refrigerator car has made this possible. Provision must be made for hot as well as cold weather. In going from the South to the North, arrangements must be made for ventilating and then closing the cars. Sometimes cars are warmed by steam, by stoves, by a lining of heavy paper, or by double walls to maintain the temperature. Many prepared and fresh foods must not be allowed to freeze. Many kinds of fresh food are wilted or made soft and become unsalable if frozen. Meat and fish, however, are frozen for keeping indefinitely.

Cold Storage. — It is impossible to deliver all perishable food immediately on its arrival in a city. So there are large cold storage buildings to hold the surplus. These are owned by wholesale dealers, by private parties, and by the large markets. They are located near the wharves and railroad-terminals where the freight arrives. These buildings are easily recognized, for they are large, high, brick structures with only a few small windows and doors. Within they are divided into rooms for the storage of different kinds of food. Ammonia instead of ice is used for keeping the building cold. We all know that when a few drops of ammonia evaporate from the hand the evaporation makes the hand cold. So in the cold storage plants, the cold obtained from evaporating ammonia is communicated to a strong salt solution, and thence to air which cir-

culates through the chambers. Part of the building is kept a few degrees below freezing, about twenty degrees Fahrenheit, and part of the building a few degrees above freezing, about forty degrees, for other kinds of food.



A Market Scene

Dangers of Cold Storage. — No one can question the advantage of cold storage to the dealer and finally to the buyer. It is the house refrigerator on a large scale. Experience has taught, however, that there are also grave dangers connected with the business. Sometimes food is kept too long in storage, and changes take place in it that may be injurious to health. People are

beginning to study the effect of extreme cold upon food. Some authorities recommend that each article shall be marked with the date of admission to cold storage, and be allowed to remain not longer than one year. Such a practice would allow food to be stored from one season to another, while it would prevent storing food year after year until a high price could be realized.

Cleanliness and Foods. — It is impossible to emphasize too much the necessity for keeping food clean, either in the home or before it reaches the home. Strict and detailed laws have been passed by the United States Government to protect meat of all kinds while it is being dressed. Much depends upon every one of us in aiding to form that public opinion which helps to make the laws. We can buy only from the clean grocery, provision store, creamery, and bakery. We can refrain from buying all food that is exposed to the dust of the street. All such food should be covered. We can wash our milk jars perfectly clean. The decaying of all food is caused by plants too small to be seen by the unaided eye. All these as well as disease germs can only be kept out of food by the greatest care.

Preservatives in Food. — Some foods are kept from spoiling by adding certain chemical substances such as boric acid and borax. This saves time and expense and preserves the shape and appearance of the fruit, which might be injured with long cooking. Such substances are considered by many to be injurious to health even when taken in small quantities. In many states, the law insists that such substances shall be named on the

label, and the buyer can do as he thinks best about buying the article.

Adulterated Food. — Food may be adulterated in many ways. Adulteration usually means mixing with cheaper substances. The pure food law distinctly defines many kinds of adulteration. A food is adulterated when any substance is added to it to affect its strength or to make it injurious. Cocoa sometimes contains starch, which weakens its strength. Food is adulterated when it has been colored, coated, or stained so as to conceal its poor quality. Jelly and ketchup are often colored because they sell better when they have a high color. Certain chemicals, called preservatives, are sometimes added to canned goods to keep them fresh. Such foods are adulterated.

Misbranded Food. — Food is sold in the market by names or brands which appear on the labels. Often some color or characteristic of the food gives it its name. A description of the food may also appear on the label. Food is misbranded when the label incorrectly describes it. Misbranded food may be perfectly wholesome, but may mislead and cheat the buyer. Sometimes starch is added to sausage to increase the weight. Such an article might be considered adulterated, because it deceives the buyer by leading him to think he has bought more meat than he really has. As the article is wholesome, if it were properly labeled it would doubtless prove an acceptable food.

The Pure Food and Drugs Act. — For more than one hundred years some of the states have been trying to

regulate the sale of unwholesome food. On June 30, 1906, Congress passed an act known as the Food and Drugs Act. This act prohibits the manufacture, sale, or transportation of adulterated or misbranded foods and drugs. The penalty for violating the law is fine, imprisonment, or both.

Limitations of the Federal Law. — This Food and Drugs Act passed by Congress is a federal law, and applies only to certain localities not under state control. It is in force in the District of Columbia and in all territories. The law also applies to food shipped from one state to another, or to or from any foreign country in unbroken packages. It is a mistake to think that this law applies to all foods throughout the United States. It has accomplished much in setting a good example to the entire country.

The Federal Law. — A law is practically useless unless money and the means of enforcing it are provided. By the act, the Secretary of the Treasury, the Secretary of Agriculture, and the Secretary of Commerce and Labor were appointed to make and publish rules and regulations to be followed in carrying out the law. They made forty regulations on the methods of collecting samples, the standards for drugs, the substances mixed with foods, and many other topics.

The Enforcement of the Law. — There are seven chief steps necessary in the enforcement of the law with any article of food. First, collectors purchase in any store samples of a food that is under suspicion. Second, part of the sample is analyzed by the Bureau of Chemistry.

Third, if the food is found adulterated or misbranded, notice is sent to the people who sold the food or who guaranteed the goods. Fourth, a hearing is granted the maker or dealer before the Secretary of Agriculture. Fifth, if the food is still declared adulterated or misbranded, the Attorney-General begins proceedings in court. Sixth, a judgment is obtained in court and the penalty of fine or imprisonment is declared. Seventh, the penalty is enforced.

A Guaranty under the Law. — Many persons think that when a food is guaranteed under the pure food law, the United States Government guarantees that the food is pure. This is a mistake. The party who manufactures, prepares, or sells the food guarantees its purity to the federal Government. The Department of Agriculture merely registers the guaranty and gives the food a number for convenience in reference. A guaranty is a promise given by the manufacturer to the Government.

The Label. — The label on a package of food must give certain information in a definite order, similar to this illustration:

1. Name of product.
2. Contents, additions, etc.
3. Name of manufacturer, if given.
4. Place of manufacture, if given.

KETCHUP
ARTIFICIALLY COLORED
(Descriptive matter)

Blank & Co.,
Springfield, Mass.

(Descriptive matter if desired)

Pure Food Laboratories. — The federal Government has established stations in many of the large cities to enforce its food law. There are twenty-one stations at New York, Chicago, Philadelphia, St. Louis, Boston, Buffalo, Pittsburgh, Detroit, Cincinnati, San Francisco, and other large cities. In each place the work of collecting samples of food and analyzing them goes on in the same way as at Washington.

State Food Laws. — Since June, 1906, many states have passed and enforced pure food laws modeled after the federal law. These may forbid the sale of adulterated foods and drugs, and of adulterated, diseased, or skimmed milk. They often regulate the sale of oleomargarine, imitation cheese, renovated butter, lard, vinegar, and candy containing alcohol and arsenic. They do much good also in inspecting slaughterhouses, dairies, and bakeries. The State Board of Health has charge of all inspections, examinations of foods, and other health matters.

City Laws. — When a state is slow in passing food laws the cities within it may make regulations to meet their own conditions. Health matters are then in charge of a city board of health or health commission.

Amount of Milk used. — The amount of milk and cream produced by farmers for distribution yearly is over 740,000,000 gallons. This does not include the still larger amount used for butter, cheese, and condensed milk. The average quantity of milk purchased by the urban population is twenty-three gallons a year for each person.

The Dairy Industry. — Dairying is so widely practised here that the United States is regarded as the leading dairy country of the world. In 1908 the total value of all dairy cows was over seven hundred million dollars.



A Modern Dairy
Note the cleanliness of the barn, the cows, and the men

In the northern and eastern sections of the United States, dairying is carried on very extensively. In large parts of these sections it is the chief occupation of the farmers. The chief dairy states are New York, Iowa, Pennsylvania, Wisconsin, Illinois, and Ohio.

The General Use of Milk. — Milk is one of the most common articles of food. Next to bread it is probably more commonly used than any other food. It forms a large part of the food of all children until they

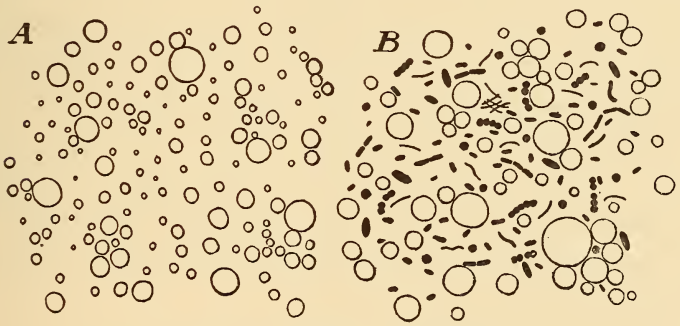
are five years of age. In cities nearly every family receives a daily supply of milk or cream. In the northern states, each individual on the average uses two thirds of a pint daily, while in the southern states scarcely one half of this is used.

The Need of Clean Milk. — Milk is usually taken raw, so if it contains disease germs, they are not killed by the heat of cooking. Germs increase very rapidly unless the milk is kept near ice. Many outbreaks of disease have been traced to impure milk. Among the most common diseases carried in this way are typhoid fever, diphtheria, and scarlatina. Diseased milk may be one of the common means of spreading consumption or tuberculosis. The health of many infants depends largely upon the cleanliness of the milk supply. Unwholesome milk causes much of the illness which often proves fatal among very young children.

How Milk is Adulterated. — There are several common ways of adulterating milk. The removal of cream by skimming, the addition of water, and the addition of substances to thicken the milk are the most common. Sometimes coloring matter and preservatives are also added. The chief danger of using thinned milk is that children fed upon it will not obtain the proper amount of food. The two great perils of milk are dirt and disease germs. Of the two, the germs are the more dangerous, because they may do greater harm, and because it is more difficult to detect them.

The Milk Supply of New York City. — The most noticeable feature is the magnitude of the industry.

About one million and a half quarts daily are required. Most of this is shipped in large forty-quart cans. More than three quarters of the supply arrives by railroad. The farmers haul the milk to stations called creameries located along the railroad. Here the milk is mixed, cooled, and put into cans or bottles. Then it is sent on milk-trains to New York City, where each dealer carts



MILK SEEN THROUGH A MICROSCOPE

A, Clean milk, showing no germs. *B*, Dirty milk, containing many germs

his own supply to his place of business. Then the bottles and cans are transferred to the retail wagons, and delivered to the customers. As much as ninety per cent of the business is in the hands of about one hundred and twenty-five large dealers who own the stations both in the country and the city.

Grades of Milk. — There are four grades of milk sold in the large cities. *Certified milk* is the purest and is offered only in limited quantities. This milk is produced by cows properly fed, watered, housed, cleaned, and kept free from tuberculosis and other diseases. Such

milk is frequently analyzed, and may be certified by a board of health. *Inspected milk* is clean raw milk from healthy cows, but not so pure as certified milk. *Pasteurized milk* is sold in a limited quantity in nearly every large city. Dairies not able to produce certified or inspected milk may pasteurize their milk. Such milk is heated to a temperature of one hundred and fifty degrees Fahrenheit for twenty minutes, and then cooled. This milk is not as wholesome as certified milk. Most of the milk sold in cities is, however, raw *market milk* produced under a great variety of conditions.

Movement for Pure Milk. — Since 1892 there have been vigorous and numerous efforts made by both private individuals and health officers to obtain a pure and safe supply of milk. There have been four different lines of work.

Milk Laws. — Most of the states and many of the large cities and towns have laws or ordinances for the improvement of milk. They relate to such subjects as the condition of the cows, the stables, the milk-house, the water-supply, milking and handling milk, and adulterating and selling milk. It is the duty of the board of health to enforce these laws, and fines or imprisonment are imposed for their violation. Milk in many cities must come up to a certain quality or standard which is set by law.

The Inspection of Milk. — To enforce the laws, inspectors are appointed to investigate the actual conditions on the farms. They collect samples of milk which are examined or analyzed at headquarters. The

inspectors note and report the condition of the farm, the buildings, the cows, the milk, and the helpers at the farm. The publication of the result of these inspections does much to improve conditions. There is some kind of supervision of milk in all cities having a population of 50,000.

Milk Commissions. — In some cities bodies of reliable men, called commissions, have been organized to improve the milk supply. They employ inspectors who examine the dairies, the cows, and the milk. Like boards of health, they certify clean safe milk. Dairymen are eager to obtain their certificate, since it is good advertising, and attracts new customers.

Pure Milk Stations. — The lives of so many infants have been sacrificed through diseased milk that a special effort is being made to furnish them with clean milk. In thickly populated sections stations are maintained where pure milk is sold at cost or less In 1908 there were twenty-one cities in the United States which had from one to twenty-eight such stations. A nurse is usually in charge who gives advice and sometimes printed directions to the mother on the care of her child. The work done at Rochester, New York, has become famous. The Board of Health maintained a central farm for the production of pure milk, and four delivery stations in the city. It has a record for eight years of saving the lives of one hundred children each summer at a cost of one thousand dollars.

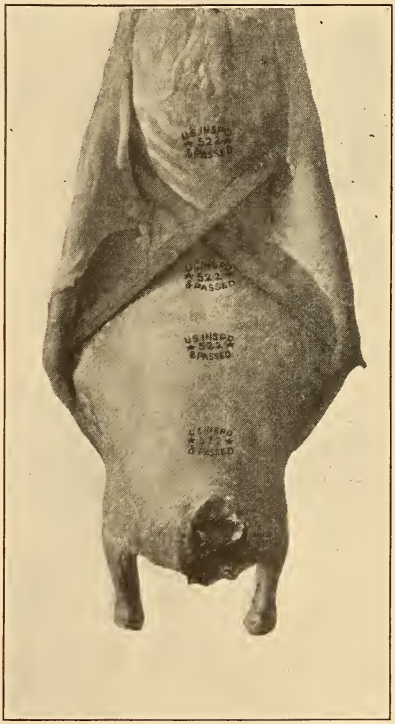
Recent Improvements. — Many promising results have been obtained from the fight for pure milk. The

general public is more intelligent about the milk question. Dairymen are more careful in selecting fine healthy cows. Cows are better fed and housed than formerly. There has also been a marked improvement in milking and in the care of the milk. The newer methods of bottling, transporting, and delivering make it possible for the milk to reach the home in a much cleaner condition. At the Paris exposition of 1900 there was an exhibition of dairy products under the care of the United States Department of Agriculture. This included fresh milk and cream shipped in hot weather from Illinois, New Jersey, and New York. Coming from three to four thousand miles the cream and milk were perfectly sweet a fortnight after being bottled. Cleanliness and cold were the only methods used in so wonderfully preserving this milk.

Meat Inspection. — One of the greatest aids in the cause of pure food is the federal meat inspection, established in 1892. The object of this inspection is to obtain a meat supply that is clean, wholesome, and absolutely free from disease.

The Importance of a Pure Meat Supply. — A pure meat supply is necessary for two reasons, namely: to meet the demands of the American people, and to meet the requirements set by foreign countries. The American people consume large quantities of fresh meat. It has been found that each person in America uses, annually, about one hundred and nineteen pounds of meat. This is more than is used in any other country except Australia.

Meat Inspectors. — The federal Government alone has a force of about fifteen hundred trained men stationed in the large meat-packing houses in this country. There are also state and city inspectors. An inspector examines each animal before and again after killing. He also watches every stage in the dressing of the meat. If in good condition the meat is marked in several places with the words, "U. S. Inspected and Passed," with a number.



MEAT, SHOWING INSPECTOR'S MARK

What the Purple Stamp Means. — When buying meat, the purple stamp may often be seen. It is elliptical in shape and about two inches in diameter like the accompanying illustration. Meat bearing this stamp has been carefully inspected and is free from disease. At the time of inspection it was clean and wholesome and perfectly fit for food.

Summary. — 1. The best way to keep food fresh is by means of cleanliness and cold.

2. Refrigerator cars and cold storage plants play an important part in the preservation of foods.

3. The Pure Food and Drugs Act of 1906 has accomplished much in suppressing unwholesome food, and in setting a good example to the entire country.

4. A guaranty under the law is a statement given to the government by the manufacturer that the food is neither adulterated nor misbranded.

5. Milk is an important, nutritious, easily digested, popular, and inexpensive food.

6. A safe milk supply can only be obtained by the help of the public in supporting health laws and officers.

Questions. — 1. What foods are produced in the United States? Where?

2. How may foods be adulterated?

3. What does a label on a food include? Can you bring to school some labels from canned goods?

4. How are the pure food laws enforced?

5. What can you find out about the milk supply of the city or town where you live? Are the farms inspected?

6. Why is clean milk necessary?

XV. THE CITY WATER AND ICE

My name is Water: I have sped
 Through strange, dark ways, untried before,
By pure desire of friendship led,
 Cochituate's ambassador;
He sends forth royal gifts by me:
Long life, health, peace, and purity.

.

For countless services I'm fit,
 Of use, of pleasure, and of gain,
But lightly from all bonds I flit,
 Nor lose my mirth, nor feel a stain;
From mill and wash-tub I escape,
And take in heaven my proper shape.

James Russell Lowell.

City Water. — In American cities water has always been plentiful. We turn a faucet, and help ourselves without a thought about the kind of water we are drinking. Only when it smells "fishy" or when we find dirt in the bottom of the glass, do we question the purity.

Safe Water-Supply. — It is easy to state what is necessary and desirable for a safe drinking water. The first and most important requirement is that the water shall be free from disease-carriers or germs. If the germs of typhoid fever or cholera are in the water, any one drinking it is in danger of having these diseases. Such water is entirely unfit for drinking. Second, drinking water should be clear. We never like to see iron-rust, sand, or dirt in water when we hold a glass of it up to the light. Third, drinking water should be colorless.

Some water has a reddish hue due to iron, and some is brownish from grass, leaves, and other vegetable matter standing in it. Fourth, drinking water should have neither odor nor taste. Sometimes an impure substance, or small plants growing in the water, will give a strong odor and "fishy" or other unpleasant taste. Such water should be examined and the trouble remedied. Fifth, it is desirable that drinking water be cool. Every one knows that warm water is unpalatable. When the temperature of water is above sixty degrees Fahrenheit, people do not like to drink it without cooling.

Pure or Purified Water. — A sufficient supply of pure drinking water is a valuable possession for any city. Sometimes, however, such a supply is not within the reach of a large city. Then the best water that is available must be purified and made fit for use even if it costs millions of dollars.

Value of Pure Drinking Water. — When the water-supply is impure it causes much sickness and many deaths. Typhoid fever is one disease which is due largely to polluted water, although it may be spread in other ways. The cost of sickness due to impure water may be roughly reckoned by calculating the expense from typhoid fever. It has been estimated that the purified water is worth to the city of Albany, New York, $475,000 a year more than the polluted river water formerly used.

Amount of Water Needed. — Probably we little realize how much water is required for a city. One hundred gallons a day is usually allowed for each person.

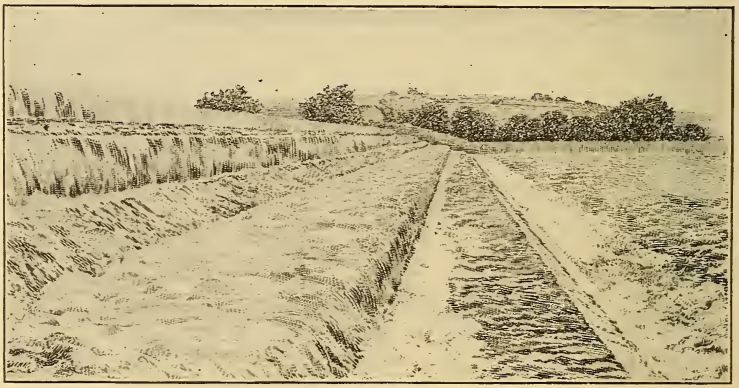
This is not only the water used for drinking but for washing, cleaning, bathing, fires, and for all other purposes. A large amount of water also is wasted by leaks in the pipes and by careless persons. The water used for drinking and cooking is a very small part, perhaps one per cent, of all that is used. Still it would never be safe to have pure water only for drinking, and to use impure water for other purposes. Many persons would be careless and drink the polluted water, and might become ill from it. So a very large amount of good water must be supplied. The amount of water that is used in some of the large cities in the United States is shown in the following table:

Place	*Year*	*Gallons per person daily*
Pittsburgh	1905	250
Buffalo	1900	233
Philadelphia	1905	227
Washington	1906	218
Chicago	1900	190
Detroit	1905	190
Cleveland	1905	137
New York	1902	129
Boston	1909	123
Newark	1900	94
Milwaukee	1905	91
Minneapolis	1904	82
Worcester	1900	70
Providence	1905	68

Rivers as Water-Supplies. — Many cities of the United States take their supply of water from the large rivers near which they are situated. This is true

of Philadelphia, Washington, St. Louis, Pittsburgh, New Orleans, Louisville, Minneapolis, Providence, Indianapolis, Kansas City, Mo., Toledo, Alleghany, Paterson, St. Joseph, Omaha, and many other smaller places.

Purity of River Water. — From general observation we know that the water of many rivers is far from being



AERATION OF MISSOURI RIVER WATER

In passing from one settling basin to another at Omaha, Neb.

fit to drink. Refuse of all kinds finds its way finally into a river. The waste from manufacturing plants and sewage are the most dangerous, and often kill fish in the river in the vicinity of the works. Sewage is the most dangerous of all, as it often carries the germs of disease. So much sickness and death have resulted from drinking water taken directly from rivers, that many cities purify such water before distributing it.

Filtering the Water-Supply. — The method of purifying drinking water most commonly in use is filtering.

A supply of muddy water may be properly filtered and thus made clear and colorless. Consequently many cities have built large water-works and filter through sand all the water used. Millions of dollars have been spent in building the works, and millions more are required each year for the running expenses. Among the large cities that filter their drinking water are Philadelphia, Pittsburgh, New Orleans, Washington, Louisville, Providence, Kansas City, Toledo, and many others.

Filtering Water. — Albany, New York, filters its drinking water which it takes from the Hudson River. The water-works consist of a settling basin, sand-filters, pure water-pipe or conduit, pumping-station, reservoir, and distributing pipes or mains. The illustration gives a diagram of the different parts.

The Settling Basin. — When filled with water the settling basin looks like a large pond or small lake. It is a large rectangular box nine feet deep, has an area of five acres, and

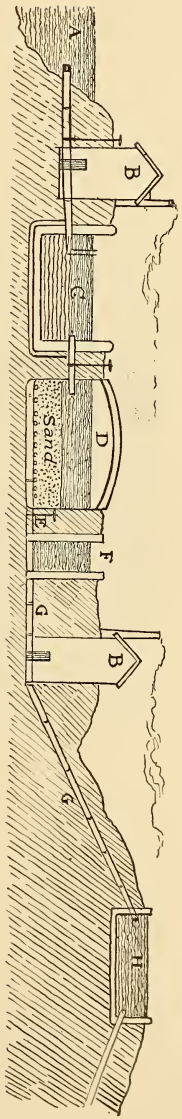
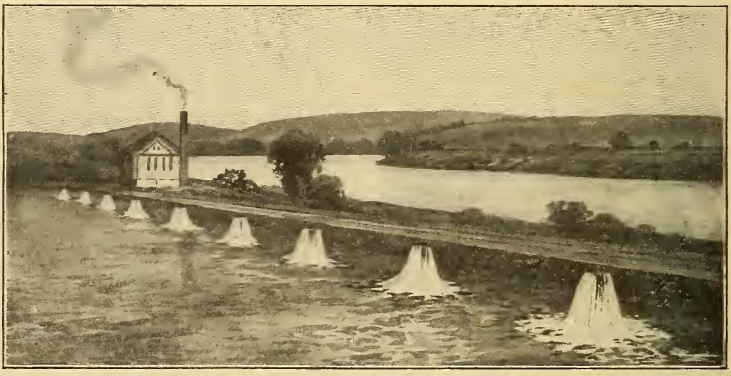


DIAGRAM OF WATER-WORKS

A, River; *B*, Pumping Stations; *C*, Settling Basin; *D*, Filter; *E* and *G*, Pure Water Conduit; *F*, Reservoir; *H*, Storage Reservoir at Elevation

is water-tight. It is located along the Hudson River, and separated from it by only a narrow strip of land. The water is taken from the river, and enters the basin at eleven different inlets. These inlets are above the surface of the water, so that the water falls down in a fountain, and is filled with air, or aerated. A glass of

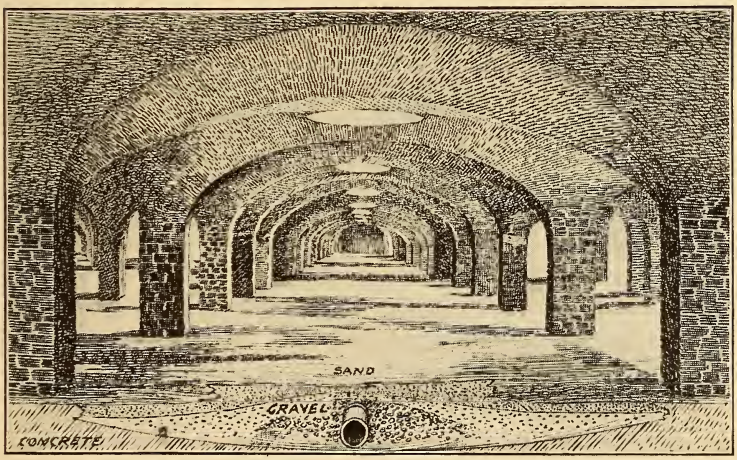


Settling Basin and Pumping-Station, Albany, N. Y.

water may be aerated by turning it from one glass to another. This will often drive off bad odors and tastes. In the settling basin, most of the sand and dirt settles out of the water to the bottom of the basin, which has to be cleaned occasionally. Eleven outlets drain the water out of the settling basin into one of the eight filters.

The Filters.—All of the filters together cover a larger area than the settling basin. Each filter is a basin eleven feet deep, built of masonry and brick, with a concrete roof overlaid with soil and grass. The following illustration represents the interior of a filter ready for use, showing the pillars which support the roof. The filters are

filled, and the water is passed slowly through sand and gravel. Water flows from the settling basin over the filter, and stands four feet deep while being filtered. Then it slowly passes down through four feet of sand and one foot of gravel. Then the pure water is collected underneath by pipes, and carried to a reservoir. The diagram on the next page shows a section through

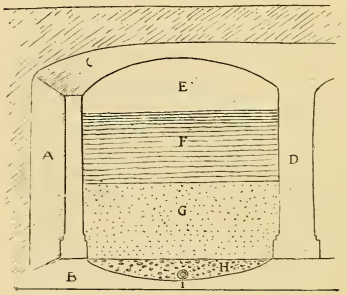


Interior of Filter

a filter. The upper layer of sand filters out most of the coarse particles, so that the filters have to be kept clean. About once a month the upper inch of sand is scraped off, and about once a year the rest of the sand is taken out, washed, and replaced.

The Pure Water.—The filtered water is stored in the reservoir until it is pumped to the large reservoir in the city, whither it goes through the large water-mains in the streets to all the buildings.

Results of Filtering Water. — Filtering a water-supply improves it greatly. Dark colored water will come from the filters clear and sparkling. A large number of the germs are also removed. Filtering drinking water saves many lives, especially from typhoid fever and diarrhœal diseases. It saves the lives of many children. In a city 250 persons out of every 100,000 inhabitants may die of typhoid fever. By filtering the water-supply, the deaths from this disease may be reduced to five out of every 100,000. A careful and scientific supervision of the filters is necessary for the surest results. Even with the greatest care, some disease germs may be carried through the filters, and remain in the drinking water. As a further safeguard the source of the water should be protected from all dangerous pollution, even though the water may be filtered. When there is an epidemic of some contagious disease, the water should be boiled before drinking it. Boil even the filtered water when there is any possibility of its spreading disease.



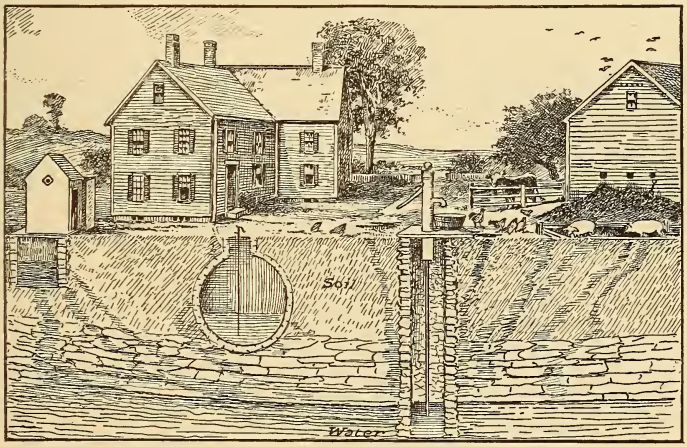
SECTION THROUGH A FILTER

A, Concrete sides; *B*, Base; *C*, Roof; *D*, Pillar supporting roof; *E*, Air space; *F*, Water to be filtered; *G*, Sand; *H*, Gravel; *I*, Conduit for pure water

Sterilizing Water. — It is a very difficult matter to render a water-supply absolutely free from germs. Filtering it has accomplished great results. Sterilizing it by electricity promises to remove all or nearly all of

the germs. This process is simple and inexpensive to install and to run. All cities may yet have a perfectly safe supply of drinking water.

Drinking Water from Wells. — Water from wells and springs is pure and cool, and especially adapted for drinking. It has already been filtered, naturally, through the soil. Except for contamination from disease germs in



Common Sources of Contamination to Wells

its course through the soil, it has been thoroughly purified. In the rural districts care should be taken that the conditions are not such as are shown in the above illustration. Here the drainage from the barn and outbuildings finds its way down into the water which is pumped up for use on the place. Well water in a city may be obtained from private wells, or from driven wells that form a part of the city water-supply. City wells are a very questionable source of drinking water, since they

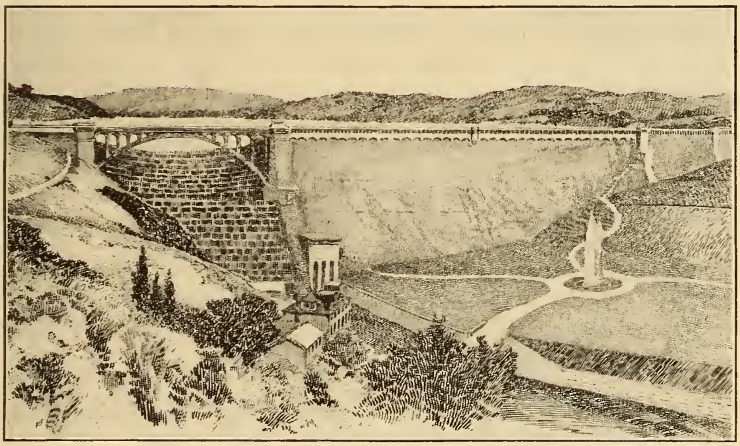
are often polluted from leaking drains. In Indianapolis nearly half the population takes its water-supply from private wells. In Richmond and in Milwaukee there are many thousand city wells most of which are polluted. The Boards of Health of these cities are making a strong effort to abolish these wells.

The Water of Brooklyn. — The Brooklyn water-works draws sixty-two per cent of its water, or 78,000,000 gallons daily, from wells driven in coarse sand and gravel. There are twenty-four pumping stations in different sections of the city, each one pumping on the average about 3,000,000 gallons of water daily. This is one of the largest supplies of water obtained from wells in this country, although there are several smaller plants on Long Island and in New Jersey.

Spring Water. — Clear, pure, spring water is our ideal of drinking water. The bottled spring water sold in cities, however, may not fill the requirements. Boards of health are beginning to recognize a possible danger from this source. Some cities require a license for dealers engaged in selling such water. Other cities forbid the use of the bottles for any other purpose, and examine both the water sold and the source of the supply.

Drinking Water from Lakes or Natural Reservoirs. — Many large cities make use of lakes as natural reservoirs. The rain that falls on a certain watershed finds its way by means of brooks, rivers, and other streams into a natural lake. A dam is built across the outlet, turning it into a natural reservoir. A large water-pipe or con-

duit carries the water from the reservoir to the city. Great care must be taken that the water is not polluted by people living on the shores of the lake, or on the area drained into the lake. A city often purchases the shores of the lake and as much of the drainage area as possible. In this way, many of the large cities in the



CROTON DAM, HOLDING BACK WATER FOR THE SUPPLY OF NEW YORK

eastern part of the United States, such as New York, Baltimore, Boston, Worcester, Springfield, Newark, and others, obtain their supply of water. On the Pacific coast, reservoirs are used, but they must be large enough to hold a supply for two or three years.

Croton Water of New York. — Ever since 1842 the City of New York has been supplied with water from the Croton River. The water-pipe or aqueduct crosses the Harlem River on an arched bridge, called High Bridge, which is one of the notable features of the city.

In 1890 a larger aqueduct carrying 300,000,000 gallons of water per day was built. To obtain this amount a dam was built across the Croton River, holding back the water in times of flood, and forming Croton Lake. From time to time, as more water was needed, other smaller dams have been built across tributaries of the Croton River, forming a series of smaller reservoirs, all of which empty into Croton Lake. This system of streams and reservoirs is now complete, as it will not be possible to obtain more water from this watershed.

The Catskill Supply. — Still the city of New York did not have water enough. It has been necessary to go one hundred miles away to the Catskill mountains for a supplementary water-supply. The large Ashokan Reservoir, holding 120,000,000,000 gallons of water, has been built. This is the largest artificial reservoir for holding a water-supply in America. It will hold water from the Esopus Creek and other areas which will be developed as they are needed.

The Water of Los Angeles. — Los Angeles has one of the most remarkable water-works in America. It takes its water from the Owens River, which is fed by many pure streams in the National Forest Reserve, on the mountains of the Sierra range three hundred miles away. The Owens River flows into the Owens Lake, which is without an outlet and extremely salt. The pure water of Owens River is taken twenty-five miles above its inlet to the lake, and is carried around the lake in a conduit two hundred and twenty-six miles to Los

Angeles. Eighteen miles are tunnel through rock, ten miles tunnel through earth, eleven miles are across canyon and depression, and the rest is a cement conduit. Five large reservoirs in the system can store 376,256,000,000 gallons of water. The water is led through a mountain and across a desert. This is the longest conduit for drinking water in the world.

The Water-Supply of Boston. — Boston and nine neighboring cities and eleven towns located within ten miles of the State House form the Metropolitan Water District. The area of the watersheds supplying the water is two hundred and eleven square miles and is situated within fifty miles of Boston. In 1909 nearly ninety per cent of the water came from the Wachusett Reservoir. The contents of all the reservoirs is 80,823,000,000 gallons, and the daily average supply to the eighteen towns and cities in 1909, as measured by meters, was 119,119,100 gallons, equal to 123 gallons for each person.

Protection of the Water-Supply. — It is not always possible to draw a water-supply from an area that is free from all population. It is desirable for the city or state to own as much of the watershed as possible, and to protect the waters. Several of the towns lying near the watershed support at great expense filter-beds for the purification of the sewage of the town. The Boston Metropolitan Board controls ten thousand acres of land, much of which is covered with forests. The trees are cared for, moths are destroyed, and fire-patrol service is maintained in the spring and fall.

On the grounds, many notices like the following are posted:

METROPOLITAN WATER WORKS

WACHUSETT RESERVOIR

BATHING
BOATING
FISHING Without a Permit
BUILDING FIRES
HUNTING
TRAPPING
SNARING
SMOKING
On the Premises of the Commonwealth
And Any Acts Tending to
POLLUTE THE WATERS
—or—
INJURE THE PROPERTY
OF THE COMMONWEALTH
ARE PROHIBITED
(Signed) William N. Davenport,
Secretary Metropolitan Water and
Sewage Board

Need of Ice. — Ice has come to be a necessity instead of a luxury. It is used everywhere for the preservation of food. In every home and retail store meat, fish, milk, butter, and eggs must be kept near ice. Lemonade and other fruit juices cooled by ice are helpful in withstanding the effects of hot weather. In winter, less ice is used in the homes, but a large amount is still necessary in hotels, restaurants, and stores.

Amount Used. — The manufacture or cutting and selling of ice is one of the large industries of the United States. In the southern, middle, and western states, manufactured or artificial ice is largely used, while in the northern states natural ice is in more common use.

There is some artificial ice sold in the North, and some natural ice shipped to the South. The Hudson River and the State of Maine produce nearly one half of the natural ice used in the United States.



Harvesting Ice

Source of Ice. — Natural ice is formed and cut on rivers, ponds, and lakes. All through the northern states, in the rural districts, there are many small private ice-houses. On many northern farms, filling the ice-houses is as important a part of the winter's work as cutting the fuel. Ice for transportation is only cut on the large rivers, lakes, and ponds.

Harvesting Ice. — Sometimes ice thick enough to cut does not form until January or February. Thick cakes of ice are cleaner, last longer, and are cheaper to har-

vest than the same amount of ice in thin cakes. When ice is covered with snow, it is first cleaned off with scrapers. If there is a layer of snow-ice, that also should be removed. After scraping, the ice is marked off into large squares the size of the cakes desired. This is done with an implement called a marker, which is drawn by a horse and somewhat resembles a plow. Several long, parallel cuts are made in the ice at one time. Driving the marker at right angles to the first direction outlines the square blocks.

Cutting Ice. — A horse and plow are driven over the first marks, and the blocks are cut deeper. Still the blocks of ice are held together by a thin lower layer. The blocks are then gradually broken apart by hand, and floated to the shore, where the ice-house usually stands. This is a large rectangular building resembling a barn, but without windows. There is a large door, and in the middle of the roof a wooden ventilator. There is also an inclined plane or elevator for lifting up the cakes of ice. The walls of the ice-house are often made of three compartments. The outer one is somewhat open, for the free circulation of air, the middle one is filled with sawdust, and the third or inner compartment is another air space.

Storing Ice. — The cakes of ice are raised from the shore to the house by horse or steam-power. Then they are packed closely together, leaving next to the walls a space which is filled with sawdust.

Distributing Ice. — When needed, ice is shipped by boat or rail for any distance and to any country. In a

city ice usually arrives in freight cars at convenient stations throughout the city limits. From these points the familiar ice-wagons deliver ice to their customers.

The Purity of Ice. — From the general appearance, it would seem as though nothing could be purer than a piece of ice. It is colorless, transparent, and without odor. Yet we hear about the dangers of using ice. Before we tell what these dangers are, we must know how ice is formed.

The Formation of Ice. — When the first really cold weather comes we find a very thin coating of ice on the brooks, puddles, ponds, lakes, and rivers. As the cold increases, the ice grows thicker. But it is important to remember that the ice grows thicker on the under side. The sticks and leaves and other rubbish found in the water are pushed down as the ice forms. If there are any disease germs in the water, they are held in the ice. During the winter the wind may have blown sand, leaves, sticks, and other refuse on the surface of the ice. It may be partly covered with snow. All of the large particles of dirt in the ice are on top, or in the snow-ice, and this should be scraped off before the ice is delivered.

Precautions against Disease Germs. — It is of the utmost importance that ice should be cut only on pure, clean water. It has been proved that if the water contains germs of disease, ice cut from that water will also contain them. It has been found, also, that these same germs gradually die if they are held for a long time in ice. So that, while the ice is stored, it is growing purer

all the time. Three conditions that make for safe ice are pure water for its formation, the scraping of the surface, and storing for months. The first two conditions exclude a large amount of dirt, and the third removes much of the danger from the smaller particles and disease germs. A fourth essential for safe ice is clean distribution.

Danger in Distribution. — When we think that ice is thrown about in dirty cars, stations, and dusty wagons, it would seem that cleaning would be necessary before putting it into the refrigerator, where food is kept. Washing it with a pailful of clean cold water is more effective in removing dirt than merely brushing it with a small corn-broom. Frequently the greatest danger comes from careless handling.

Precautions in Using Ice. — It is necessary to wash out the refrigerator every time that ice is put into it. Care should be taken to remove all sticks and sand in the small pan or tray in the floor, and from the waste-pipe leading from it. Instead of putting ice in the water, it is more healthful to use water that has been cooled in a bottle set in the refrigerator. The water is not quite so cold, but the danger from disease germs is avoided.

Tanks. — Tanks for ice-water in hotels and public places should be double, with the water in the inner tank, and the ice in the outer tank. Then the water does not come in contact with the ice. Ice is very necessary in the home, and must be used intelligently so as not to be dangerous to health.

Summary.— 1. Safe drinking water must be free from disease germs and injurious substances, and must be clean.

2. Water-supplies are obtained from rivers, lakes, springs, and wells.

3. The waters of most large rivers need to be purified before they are suitable for drinking.

4. Drinking water may be purified in different ways, as by filtering and by standing in large settling basins.

5. The water-works of Albany consist of a settling basin, sand-filters, pure water-pipes, pumping-station, reservoir, and distributing pipes.

6. The four requirements of safe, natural ice are: pure water for its formation, scraping, storing, and clean distribution.

Questions. — 1. What is the difference between pure and purified water?

2. Of what value is a pure water-supply?

3. How is a water-supply filtered?

4. How does the city or town where you live obtain its water-supply?

5. What protection should a water-supply have?

6. What precautions are necessary in using ice?



A Household Filter

XVI. THE CITY REFUSE

A people's health's a nation's wealth.
Benjamin Franklin.

Health and Waste Material. — A safe water-supply and a sanitary disposal of all waste material are among the most important questions of public hygiene. In small cities and rural communities the problem of waste disposal causes the most trouble. Waste material should be removed quickly and regularly from houses. Bad odors due to neglect are a warning of unhealthful conditions, which should be quickly remedied. In times of sickness and epidemics, such conditions about houses are a real danger in spreading disease. A bad odor about a house is like a pain in the body, a danger signal which should never be overlooked.

Kinds of Waste Material. — The waste material of a city may be divided into six classes: sewage, ashes, garbage, rubbish, street-sweepings, and snow. We little think what a problem it is to collect the city waste, and to dispose of it in a sanitary manner. The sewage runs off in the sewers and is cared for separately. Snow also is a separate and additional expense. Of the other waste material, garbage, ashes, rubbish, and street-sweepings, there were in the three boroughs of Manhattan, the Bronx, and Brooklyn, of the city of New York, 2,456,000 tons in one year. The city of Buffalo collected 190,000 tons; Philadelphia, 834,000 tons; and

Newark, 256,000 tons a year. In the average American city, from 12 to 15 per cent of the entire weight of waste material is garbage, from 8 to 12 per cent is rubbish, and from 65 to 76 per cent is ashes, including the street-sweepings.

Sewage Disposal. — The disposal of water after it has been used has proved nearly as difficult a problem as



Chicago Drainage Canal

the supply of pure water. There are several (nine) different methods by which cities dispose of their sewage. Whatever method is employed must be sanitary, and must not cause trouble to any neighborhood. It must not be too expensive, and when possible, should return an income to help pay the running expenses.

Rivers as the Outlets for Sewers. — The simplest and most common method of emptying or discharging sewers is into large bodies of water, as rivers, lakes, and the ocean. Chicago has spent nearly forty million dollars for a drainage canal to run from Lake Michigan to the Des Plaines River. This was to change the flow

of the sewage from Lake Michigan, where the city obtains its water-supply, into the Des Plaines River, which flows into the Illinois River, and finally into the Mississippi.

Danger from River-Water. — Sewage mixes with the large amount of water in a river, and disappears without a nuisance. As the river flows on important changes take place, and the water gradually becomes purified. In this way the river is not a serious danger to the health of cities located long distances apart upon it. With only a short distance between cities along a river that receives sewage, the river water has often become a serious danger and the cause of sickness and death.

The Ocean as an Outlet for Sewers. — Cities situated on the coast may easily discharge their sewers into the ocean. Here there is no danger of polluting water-supplies. New York discharges 450,000,000 gallons of sewage daily into its harbor. The water of the harbor takes care of this large amount without a nuisance except at a few points where conditions will soon be improved. This method should be used with precaution as to the location of the outlets, when beaches along the shores are used as pleasure resorts.

The Boston Sewerage System. — Boston as well as twenty-five neighboring cities and towns are under the control of the Metropolitan Water and Sewerage Board. In this large area of one hundred and ninety-one square miles, there are two related systems of sewers, the north and the south districts, which discharge into Boston Harbor.

Sewage Farms. — Many inland cities have no large body of water to take care of their sewage. Under such conditions the sewage may be purified in one of several ways. Sometimes sewage is used in place of water on cultivated land. Such areas are called sewage-farms. The city first secures a large tract of land suitable for the purpose. Then the land is leveled and drained. The sewage is conducted to all parts of the field by a complete system of irrigation. Large crops of hay, grain, peas, onions, corn, and sugar beets have been raised in this manner. It is safer to raise only those vegetables that are cooked before using.

Farms in the West. — The sewage farm of Pasadena is well known. In 1904, 460 acres of land were under cultivation. From December to April the sewage is used in the section where English walnuts are grown. This crop alone brings an income of nearly ten thousand dollars. From April to December, the sewage is used for vegetable crops in the open fields. Such farms are also found at Salt Lake City, Hastings, Fresno, Pomona, Redlands, Santa Rosa, and other places.

Filtering Sewage. — Instead of allowing the sewage to flow over cultivated land, prepared beds or filters may be used. Large areas or filters are prepared with four or five feet of sand and gravel or cracked stone. These beds have ditches to carry the sewage to all parts of the bed and underdrains to carry off the purified liquid. The sewage is let on the filter till it stands about one inch deep, and is then allowed to pass slowly through the sand. The air and the sand

purify the sewage, so that it is safe to run the liquid into any small river. There is, however, one important condition for success. The filtering must not be carried on continuously. A period of filtering must alternate with a time of rest so that the sand may be filled with air to purify the next amount of sewage.

Filter Beds. — Many cities have been to great expense to build and maintain filter-beds. The Massachusetts State Board of Health established in 1887 the first filters, which consisted of ten small experiment tanks at the Experiment Station on the banks of the Merrimac River at Lawrence. This process was recommended to the cities and towns of Massachusetts, and many of them have adopted it. The filtering of sewage has also been employed through the middle and western states. In Ohio alone there are twenty-six such areas.

Collecting the City Waste. — There are two general methods of collecting waste material. In some cities the ashes, garbage, and rubbish are kept separate by the householders, and different wagons collect each kind by itself. In other cities the material is all thrown into one bin and all collected together. Whether one method is better than the other depends entirely upon the disposal of the material. It is necessary, however, to have any material that is likely to decay collected often.

Time for Collecting. — Garbage should be collected regularly and at a definite time. Daily in warm weather and two or three times a week in cold weather is not too often. Ashes need not be collected so frequently, since they do not decay. Once a week, the year round, is

sufficient. The day of collecting should be known so that the householders may be prepared. In some cities the ash-barrels must be on the sidewalk, while in other cities they may be in the yard. Placing the ash-barrels on the curb is a poor practice, for their contents are much more likely to be blown about or disturbed



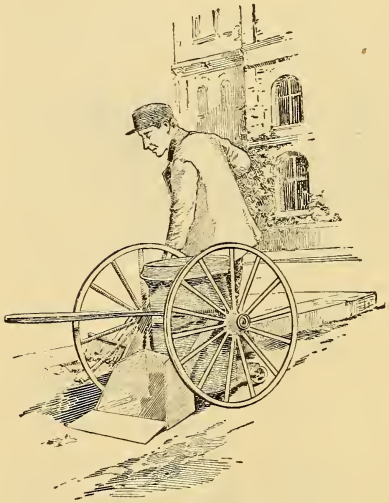
New Type of Garbage Collection Wagon

by boys and rag-pickers. This practice gives a city a very untidy appearance.

Collecting the Street-Sweepings. — Sweepings are usually collected separately, although this material may contain much rubbish. A large street-sweeper in general use is drawn by one or two horses. The dust is swept to one side of the road, where it is collected into piles by men, and delivered into a cart which follows the sweeping-machine. A smaller sweeper pushed by one man is in use in some cities. Sometimes a crew of men clean the street, and deposit the dust in cans carried along on a low wagon.

Cleaning Small Areas. — Hand-carts, cans, and bags are useful in keeping crossings and small squares neat and clean. A man can often collect leaves, papers, and other refuse with a hand-cart where a horse cannot go.

Requirements for Refuse Disposal. — Whatever system of disposal is adopted by a city, it should fulfil two conditions: (1) it should be done in a sanitary manner, and not be objectionable to the sight or smell; (2) it should be conducted at as low a cost as possible with satisfactory results.



Rubbish Cart

Disposal of Waste Material. — Several ways have been employed by cities to take care of their waste material. Dumping on land is one of the simplest and easiest ways, and has long been in use. Ashes are well adapted to filling in low places and to making new land. When garbage and street-sweepings are used in this way many years are required for complete decomposition before the land is fit to live on. In the meantime, it may be a source of great annoyance and trouble to the neighbors. When rubbish is also added, a great city nuisance is

created. The wind blows old papers about, and litters streets and yards for a long distance. Boys like to build fires on the dump, and so endanger surrounding property. The annoyance from the smoke, dust, and odors of a fire burning on a dump can only be properly condemned by one who has experienced them.

Made Land. — Much valuable land has been made or improved by dumping ashes. On Riker's Island, in the East River, New York, about eighty acres have been made and are valued at $10,000 an acre. Comparing an old map of Boston with a recent one will show that a very large section of that city from Columbus Avenue and Charles Street to the Charles River has been made or reclaimed from the water in this way. This area includes some of the most valuable property in the city. In Chicago, Grant Park has been partly built with the city ashes.

Dumping in Water. — All kinds of waste material have been dumped into large lakes or into the sea by cities located on their borders. This is an easy way to dispose of refuse. The material is loaded on large flat boats or scows, towed out into deep water, and dumped. Special boats have been built for this purpose.

Disadvantages. — There are many disadvantages in this method. During the winter, storms and rough waters interfere with the service, and the material will collect at the stations and become troublesome. A still greater annoyance is the washing ashore of old mattresses, barrels, and light material on the shores of the pleasure beaches along the coast. Bathing under

such conditions loses much of its charm. After carrying refuse out to sea fifty miles or farther, some material is still likely to be washed ashore.

Plowing Material into the Soil. — Only part of the material — garbage and the street-sweepings — can be disposed of in this way. So large an area would be needed by any city that this would hardly be practicable. Moreover, in cold weather in northern cities, it would be impossible to plow the land.

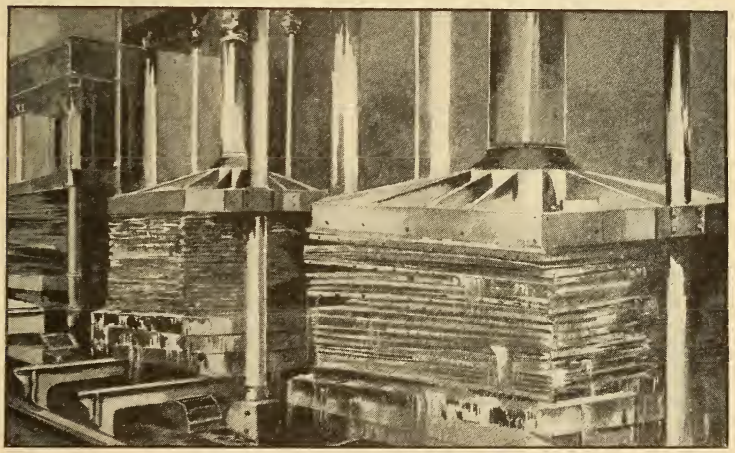
Feeding to Swine. — In some small cities or towns the garbage could be fed to swine. The material would need to be kept free from other refuse, and be collected regularly every day while fresh. Worcester, Massachusetts, feeds the city garbage to swine on the poor farm, and receives a good price for the pork produced. Other methods are probably better adapted to large cities.

Treating Garbage. — Many large cities dispose of the different kinds of wastes in various ways. The treatment of the garbage is one of the larger problems, partly because it forms from twelve to fifteen per cent of the entire waste, amounting to thousands of tons, and partly because it must be done quickly and regularly before the garbage decomposes.

The Treating Process. — In some cities a large building or plant is erected containing many large tanks. The garbage is emptied into these tanks, and heated to a very high temperature. Then the material is pressed, and all the fat and water runs out. What is left is sold for fertilizing the soil. The fat is sold for about three

cents a pound, and is used in the manufacture of cheap perfumery and wagon-grease. The garbage is changed into water, fat, and fertilizer material, and the last two substances are sold to help pay the running expenses.

Objections to this Process. — The furnaces and buildings are very costly, so that only large cities are able to erect them. The plants are also very expensive



Pressing Fat from Cooked Garbage

to run. Many of the plants create very bad odors so that they have to be located outside of the city, which makes a long and expensive carting of the garbage. Works for treating garbage have been erected in New York, Philadelphia, St. Louis, Cleveland, and other cities. Some cities have tried this method and given it up, on account of the great expense of running it.

Burning Waste Material. — Burning has the advantage of disposing of all kinds of waste material. Ashes

can be burned as they still contain from fifteen to thirty per cent of material that will burn. Garbage may be dried and then easily burned. Much of the rubbish is dry and very combustible when collected. The rubbish, street-sweepings, and ashes may be used as fuel for burning the other waste materials. This method is largely used in cities in England. In America crematories are in use in New York, Syracuse, Chicago, San Francisco, New Orleans, Los Angeles, and many other places.

Advantages of Burning. — Great advantages are claimed for crematories. First, they care for all kinds of waste, and burn them all to ashes. Second, the process is not very expensive as the rubbish, ashes, and street-sweepings form the fuel. Third, the expense may be still further reduced by converting the heat into electricity for use as power. Fourth, it is a sanitary process, as all disease germs are killed. Fifth, more than one plant can be built, which would reduce the running expenses by shortening the distance for carting. Sixth, only one collection of waste is necessary and the different materials do not have to be kept separate.

City Crematories. — A crematory usually consists of a long narrow building with a very high chimney. The building may be divided into two rooms, a small furnace room and a long packing room. Through the center of the packing room runs an endless steel belt, which is level for part of the distance, and then rises along an inclined plane. On either side of the level track are large wooden bins which connect with large

presses in the basement. The elevated part of the belt is directly over a platform above the furnace.

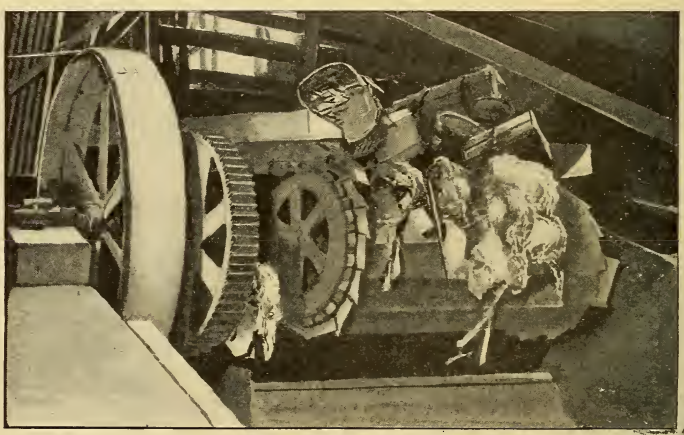
How the Refuse is Burned. — A city cart filled with refuse drives through the doorway into the crematory. It dumps the material on the platform above the steel belt, which carries it along between the two rows



Sorting out Salable Refuse

of bins. Here men are stationed who take out paper, cardboard, rags, clothing, carpets, leather, rubber, bottles, and tins and put each in its proper bin. All articles that are salable — about one fourth of the entire amount — are taken off the steel belt as it travels between the two rows of men. The material picked out is of such value that contractors are willing to pay $1.98 per ton for it. In New York, the weekly privilege of picking out material has sold for sums varying from $1175 to $1920. The worthless ma-

terial is carried over and upward, and finally drops off the belt into the furnace. The sorted material that has dropped into bins in the basement is then pressed, and made into bales ready to be sold and carried away. The heat from the burning refuse is the source of power for the moving belt, for lighting the



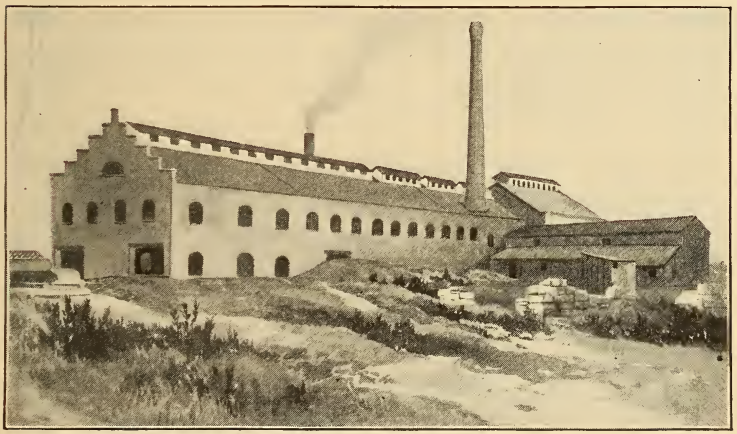
Belt Carrying Refuse to Furnace

building with electricity, and for heating the building by steam. This is certainly a clean and safe way of disposing of refuse of all kinds.

Snow on City Streets. — A heavy fall of snow in a great city causes a large amount of trouble, work, and expense. The storm may damage the wires, delay traffic, and interfere with business. Along the main streets, the trolley snow-plow throws the snow off the car-tracks to the sides. Teaming and traffic of all kinds are very difficult until the piles of snow are removed.

The Removal of Snow. — If the fall of snow is

followed by a few days of melting, there is a still greater need of removing it and clearing the gutters so that the water may run off into the sewers. Snow is carted off in large wagons that have swinging sides or that dump from the rear. Sometimes the city teams remove the snow; sometimes the entire work is let out



Garbage Crematory at Buffalo

to contractors, who do the work at a certain price agreed upon.

Dumping Snow. — When a city is situated on a river, lake, or ocean, the snow is often carted and dumped into the water. When the water is a long distance away, snow is sometimes dumped in vacant lots in or near the city. In warm climates, and when there is little snow, it may be washed into the sewers, if they are large enough to carry off the additional water.

The Expense. — The cost of removing snow from city streets must vary according to the amount of snow, and the location of the city. In the city of New York, the annual cost of removing snow is nearly $3000 a mile, or thirty-three cents a cubic yard.

Public Cleanliness. — While personal cleanliness requires a great amount of time, work, and expense, public cleanliness presents still greater problems. But it must be remembered that the health of a city depends upon the right solution of these questions.

Summary. — 1. Waste material should be removed quickly from all houses and in a sanitary manner.

2. Sewage emptied into lakes and rivers should first be purified by filtering.

3. In regions where water is scarce, sewage is used in raising crops.

4. Dumping the city rubbish into the ocean is an unsanitary practice as it is soon washed up on the beaches along the shore.

5. Burning or cremating all of the city waste is the most sanitary, and probably the most satisfactory arrangement.

6. The removal of snow is necessary on the chief business streets of a city.

Questions. — 1. What are the different kinds of city waste?

2. What is the most sanitary disposal of sewage?

3. How is the waste collected in the city or town where you live?

4. What kinds of wagons are used for this purpose?

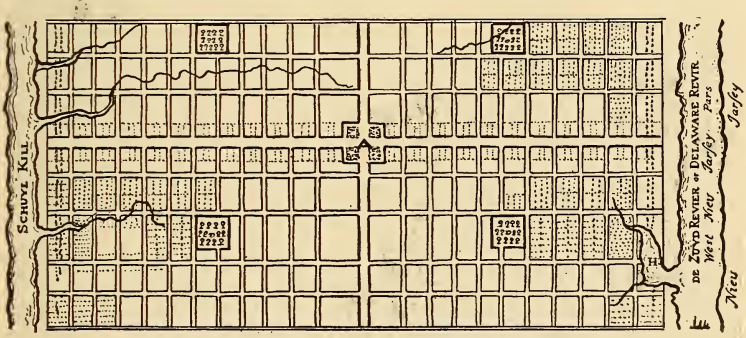
5. What are the advantages of burning the city waste?

6. Of what value are street-sweepings?

XVII. THE CITY STREETS

"Why don't they keep the streets a little cleaner?"
You ask with deep annoyance not undue.
"Why don't they keep the parks a little greener?"
Did you ever stop to think that they means you? — *Life.*

The General Appearance of a City. — The appearance of a city plays an important part in its growth and development. An attractive city appeals not only to desirable residents but also to travelers and tourists.



William Penn's Plan for Philadelphia

A city should not only be healthy and safe, but should have convenient and stately streets and buildings.

City Plans. — In many American cities the cross streets run at right angles to several long, parallel avenues. This is called the checker-board plan. New York and Philadelphia are notable examples of such planning. Philadelphia was the earliest city in America laid out in this way. The first plan of Philadelphia was

prepared under the direction of its founder, William Penn. The original city covered about two square miles, and was laid out according to the plan in 1682. This plan indicated Logan, Rittenhouse, Franklin, and Washington Squares as the possible limits of the city.



A View in Washington

A comparison of this plan with a map of the city today, will show how much the city has grown.

Washington. — The national capital, Washington, has been called the most beautiful city of America. This honor is due largely to its beautiful streets, avenues, and squares, as well as to its large and imposing buildings. Most of the streets are laid out at right angles according to the checker-board plan. In addition,

there is a system of fine avenues running diagonally through the city. Where the diagonals and streets meet, many beautiful squares have been laid out. Indianapolis also has broad diagonal avenues which meet at a circular park in the center of the city.

Chicago and Buffalo. — The plan of Chicago shows that its streets are laid out at right angles. In addition there are several avenues radiating in different directions from the heart of the city to the suburbs. These are a direct means of traffic, and serve as routes of car-lines to all parts of the city. The plan of Buffalo also is an improvement on the checker-board plan. Main avenues radiate from the business center, which is near the water-front. They connect nearly all parts of the city with the business quarter.

Cities without Plans. — Many American cities have grown from towns and villages without definite plans. The narrow and crooked streets of Boston are a result of such growth. After business blocks are once erected it is difficult to widen streets or sidewalks without great expense. Sometimes a fire or an earthquake destroys so many buildings that it is possible to rebuild a city on a grander scale.

Replanning a City. — Often, as a city grows, it is necessary to adopt a new plan for its future development. Then the chief public buildings are located near one another, and may be placed along a fine avenue, or about a square. This would form the civic center of the city. Sometimes neighborhood centers are planned about a park, a branch library, a public bath-house or a

schoolhouse. A park system with boulevards usually holds a conspicuous place in any new plan.

The Need of a Plan. — Many cities are just awakening to the fact that they need a plan for future growth. Such a plan would prevent the building of narrow streets and the crowding of dwelling houses. Some of the larger and older cities have spent millions of dollars to relieve the overcrowding that a good city plan would have prevented. If a plan for the city streets was in force, land speculators would find it hard to build for their private gain to the injury of the public.

City Streets. — The streets of a city may be laid out and built either by the city or by any person who owns the land. The better way is for a city to build the streets and sidewalks before the houses are erected. Then the street will be of the width best suited to the neighborhood, and all of the sidewalks will be built. When real estate dealers buy a section of land for buildings, the object usually is to make the most money rather than to make the best neighborhood.

The Names of Streets. — A very common practice in American cities is to number the long avenues, as First or Second Avenue. The streets that cross these are then lettered, as A Street and B Street. The only advantage of this prosaic method is that it is easy to find any house. The address indicates the location. The city of Paris has a unique and satisfactory way of indicating the streets. They are named for scholars in one district, for soldiers in another district, and for an event in a third. Naming the streets for men

and women of distinction is a valuable custom. Local history and traditions may also be preserved in the names of streets.

The Width of Streets. — Many of the streets in cities are not wide enough to let in sufficient air and sunlight.



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A Wide Business Street in New York

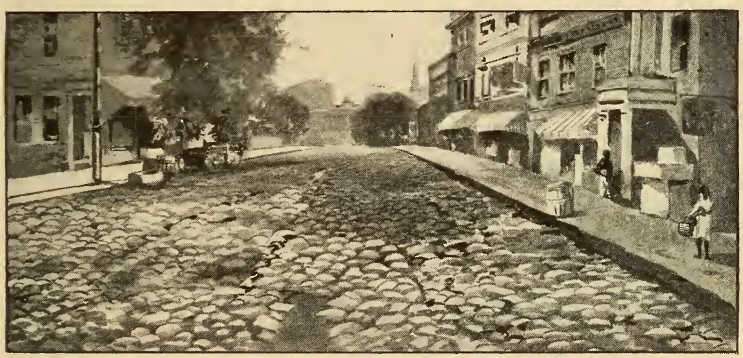
High buildings and narrow streets are a menance to health. Wide streets are a great aid to traffic in the business districts. In the center of a city, streets of 100 to 140 feet are not too wide to prevent crowding. In a residential district, the streets may be from 60 to 80 feet wide. Even then there may be a wide sidewalk and a strip of grass or parking. In many of the older

places in New England the streets are only 30 to 40 feet wide. In the West a street is seldom less than 60 to 66 feet in width. The main avenues in Washington are 160 feet wide, and in New York 135 feet. The proportion of the area of streets to the entire area of a city varies very much in different cities. In Washington 43 per cent of the entire area is devoted to streets and alleys. The area of streets in New York City is 35 per cent, in Boston 26 per cent, in Philadelphia 29 per cent, and in Duluth, Minnesota, 86 per cent.

A Good Street or Road. — We all appreciate a fine street when driving or walking. A well-built street should be dry. During a heavy shower the water runs into the gutters, and the street soon dries. A fine street should be solid. On a sandy or soft street the wheels cut into the soil, and traffic is very difficult. A good street should never be steep. Driving down steep roads, as well as up, is difficult and takes more strength and time than on nearly level roads. A fine street must be smooth. Uneven places or stones lying in the road make driving very unpleasant.

Kinds of Streets. — In order to make traffic and cleaning easy, most of the city streets are improved or paved. The construction of roads is one of the problems of engineering. All roads are built with at least a foundation and a surface layer, which forms the pavement. The kind of pavement used gives its name to the kind of street. The pavements of streets are built of earth, gravel, stone blocks, wood blocks, brick, asphalt, and broken stone.

Gravel Streets. — In the suburbs of cities there are still many streets built of earth. There is usually little traffic, and the time has not yet arrived for the use of more enduring material. Many cross streets of cities were made of gravel before the introduction of the more modern paving, and are still doing good service.



A Cobblestone Pavement

Stone Block Paving. — Most of the older cities in America can still show many miles of streets with the old cobblestone pavements. They were an improvement on mud, but are difficult for teaming and very painful for driving. Many of these streets have been repaved or covered with smoother material. In the more modern stone pavements the blocks are cubical in shape, and make a smooth pavement. The disadvantages of this kind of pavement are that the streets are noisy, wear smooth and slippery, and are difficult to keep clean.

Wood Pavements. — Some of the best pavements have been made of wood blocks of either cylindrical or

cubical shape. This pavement is perfectly smooth, durable, noiseless, and without dust. Some of them, however, have proved very slippery when wet. Most of the large cities have experimented with this kind of pavement, and Chicago has 650 miles of it.



Wood Block Pavement

Brick Pavements. — Streets of brick paving are increasing in number. They are largely used in Philadelphia, the cities of Ohio and Illinois, and in many smaller western cities and towns. Such streets offer a sufficiently smooth surface, are easily repaired and cleaned, and are not very noisy.

Asphalt Pavements. — Asphalt forms a very smooth and popular paving. Philadelphia has over 350 miles of it, and Buffalo over 200 miles. It is noiseless, easily cleaned, durable, easily repaired, and produces neither mud nor dust. It makes an excellent street for either city or suburban districts.

Broken Stone Streets. — The streets in the suburbs of a city are often made of broken stone. They are easy

for driving, comparatively noiseless, and of moderate cost. They are, however, muddy when wet, dusty when dry, and are difficult to clean. Many of the park roads and state roads are built of this material. Some of the smaller cities have fine stone or macadam roads.



Asphalt Pavement, Chicago

The city of Newton in Massachusetts has sixty miles of the finest kept roads. Waltham and Cambridge, in Massachusetts, and Staten Island, in New York, have many miles of macadam streets. Boston has three hundred miles of such streets, mostly in the suburbs.

Dusty Streets. — The prevention of dust on streets has come to be a serious question. Since automobiles have become common, the raising and scattering of dust has greatly increased. The broad heavy tires of automobiles draw out the small particles from the road, and raise clouds of dust. The wearing away of the surface of some pavements also causes dust. The damage from

dust may be very serious. When blown into a house it settles upon pictures, furniture, and books. On some streets closed windows are more comfortable than open ones. Occasionally the value of fine estates have been greatly reduced by the constant presence of great clouds of dust raised by the passing automobiles.

Sprinkling Streets. — The most common way of laying the dust is by sprinkling the streets with water. Since it is necessary, however, to sprinkle a street seven or eight times a day to make it dustless, this is very costly. Salt water also has been tried but is not satisfactory. The mud injures clothes, vehicles, and other objects, and the dust is very irritating to eyes and throats.

Oiling Streets. — Various kinds of oils and mixtures of oil with water and potash have been tried. Some attempts have been very successful in allaying the dust. Sometimes officials have been too generous with the oil, and covered plants, sidewalks, trees, and vehicles with it, much to the discomfort of passers-by.

The Use of Tar-Products. — The most satisfactory results have been obtained by using a preparation of coal-tar products. This is spread on the entire street and allowed to harden before using. It has the double advantage of not only preventing dust, but also of preserving the surface of the street. Such roads will stand the traffic of many heavy automobiles and still be dustless. Many long roads stretching from city to city throughout the country have been treated in this way in recent years.

Clean Streets. — It is not dust alone that makes streets dirty and unsanitary. Old papers, horse-droppings, ashes, leaves, chips, fruit-peelings, and other rubbish are seen in the streets. The value of clean streets to a city is very great. They add much to the fine appearance of a city. The residents enjoy walking



THE DUST NUISANCE

and driving better when the streets are clean. Windows and doors may also be kept open for the better ventilation of the houses.

How Streets are Cleaned. — When a street is to be cleaned a watering-cart first goes over it to lay the dust. Next a machine-sweeper, drawn by one or two horses, sweeps the dirt into a line on one side of the street, near the gutter. Then a squad of men follow with brooms and brush up the dirt into piles along the side of the street. Carts soon follow, and the men shovel the dirt into the carts. The sweepings are then hauled away to dumps, vacant lots, or to scows that

take the material out to sea. Some streets are swept by hand instead of by machines.

Time for Cleaning Streets. — In the business sections of a city most of the cleaning must be done during the night so as not to interfere with traffic and business. During the day, push carts may be used to pick up waste paper, fruit-skins, and other refuse. Such streets should be cleaned every night. In the residential part of the city and in the suburbs the work is done during the day and much less often.

Waste Barrels. — In some cities barrels are placed at conspicuous places along the street for the reception of papers and other refuse. They may bear a legend to encourage cleanliness, for example, "Be sanitary and you'll be sane." It is important that these barrels should be kept clean and not be allowed to become overfull. Iron boxes attached to posts may serve the same purpose,

The New York Streets. — The most notable example in the cleaning of streets was that of New York, while Colonel Waring was Street Cleaning Commissioner. He introduced new wagons and utensils, and new methods of work. He improved the condition of the men in his employ, and obtained much better results. He raised their wages, and put them into white uniforms. He formed the first Juvenile Street Cleaning Leagues of New York. Forty-four leagues with a membership of 2500 school children were enrolled in the crusade for cleanliness. The chief object was to urge their parents and housekeepers to obey the sanitary

laws. For five years they did enthusiastic and valuable work until the resignation of Colonel Waring, soon after which the leagues were disbanded.

The Juvenile Street Cleaning Leagues. — In 1908 leagues were again organized for volunteer aid to the Department of Street Cleaning. There are nearly one hundred leagues with a membership of over 25,000 children. Each league is connected with a public school and is often under the direction of a teacher. Each child receives a certificate of membership. All of the leagues have adopted the following uniform civic pledge, which is read at each meeting:

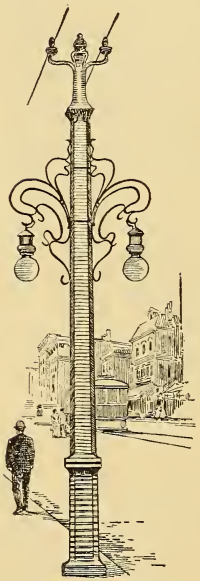
> "We, who are soon to become citizens of New York, the largest city on the American continent, desire her to possess a name that is beyond all reproach, and therefore we agree to refrain from littering our streets and as much as possible to prevent others from doing the same, in order that our city streets may be as clean as our city is great, and as pure as our country is free."

Each league holds its meetings at a school-building, and elects its officers and committees. Over 3000 badges have been distributed to the officers and to the members as rewards for faithful work. The school and street committee prevent the throwing of waste paper about school-buildings. The sanitary committee urge upon their neighbors the necessity of keeping their homes, halls, and cellars in a sanitary condition. The vigilant committees look after the blocks in which they live. Each member carries a copy of the sanitary laws, and explains them to the people living on his own block.

Most of the work of the leagues is in harmony with the motto on the badges:

"We are for Clean Streets."

Street Lighting. — Well-lighted streets are a necessity in a safe city. Philadelphia is probably the best lighted city in the country. There are many small courts and passageways which are all sufficiently lighted. The street lighting in New York is very spectacular. The central part of Broadway is probably the most brilliantly illuminated avenue in the world.



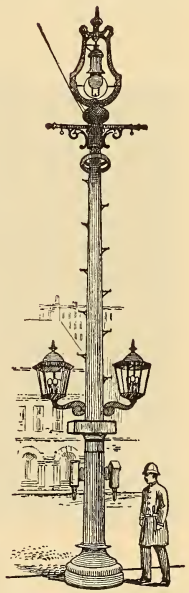
Electric Lamp Post

Electric Lamps. — Electricity is used almost exclusively in the business sections of cities, and in the chief streets of the residential sections and suburbs. There are several styles of lamps used, including the arc, the incandescent, and the tungsten. Philadelphia has over 9000 arc lights, Chicago about 6000, and New York about 12,000. Some of the smaller cities like Spokane and Syracuse use electricity entirely for lighting.

Lamp Posts. — There is an endless variety of designs for electric lamp posts. Most of them are variations of three types, the straight post with an upright lamp support, the post with a Bishop's crook, and the post with a horizontal mast-arm. Some cities make the

posts serve an ornamental as well as a useful purpose.

Gas-Lights. — Gas is still used largely for lighting cross streets and alleys. The incandescent lamp is generally used, and gives a very satisfactory light. St. Louis has over 9000 more such lights than of any other kind. Boston has 8000 more and New York has 7000 more than any other kind.



Electric Lamp Post

Trees on the City Streets. — Shade-trees are a great addition to the streets of the residential districts of cities. They add to the healthfulness of a region by lessening the intense heat of the city streets in summer. They also relieve the great monotony of rows of brick blocks. By improving the general appearance, they increase the value of the houses located along the street.

Characteristics of Shade-Trees. — Not all trees are suitable to plant in streets. A shade-tree should be hardy and long lived so as to last fifty years or more without replanting. A shade-tree should be straight and well-shaped to be an ornament to the street. It should be cleanly and free from insects, so that the leaves, flowers, or fruit will not fall upon the sidewalk beneath. A shade-tree should be only of medium size so that it will not shut out light and air from the houses beside it.

Kinds of Shade-Trees. — The experience of cities has shown that there are only ten or twelve different kinds of trees that make ideal shade-trees. The Norway, sycamore, and red maples are stately and attractive. The pin oak, the red oak, the scarlet oak, the



A Street in St. Louis

linden, the elms, the horse-chestnut, and the ash are all valuable for city trees. A study of the trees planted in a section of a city or town would be very instructive.

The Care of Trees. — In order to live under the trying conditions of a city, the trees should receive the very best treatment. They should be set out with great care, and should be watered, pruned, staked, and guarded. A row of well-trained trees on each side of a street is a beautiful sight. Some cities employ a city forester whose chief care is the city trees.

A City Forester. — This officer is fully equipped for his duties. He has a staff of men well-trained in forestry. He also has the latest devices for the handling and the spraying of trees. Among his duties are the planting of trees along the city streets. The spraying of trees when infested with injurious insects often becomes necessary. The pruning and cutting down of injured and dead trees also comes under his supervision. Sometimes a Shade-Tree Commission performs the duties of a city forester. In towns and villages the tree wardens have the care of the trees along the public highways.

The Use of Streets. — The city streets are for the use of the public, but for the convenience of all persons it has been found best to regulate traffic. Heavy teaming is forbidden on many parkways and boulevards. The rate of speed is also limited. There are also many other regulations.

The Traffic Regulations. — In some cities the Board of Street Commissioners issue street traffic regulations and rules for driving. These apply to vehicles in motion, to their speed, to their stopping, standing, turning, and to care in driving. On some narrow and crowded streets vehicles may drive in only one direction. A special squad of mounted police patrol the business section of a city to enforce these regulations. Any one violating a regulation is liable to a fine.

Summary. — 1. Many American cities are laid out according to the checker-board plan.

2. When replanning a city, many of the finest public buildings are located near each other to form a civic center.

3. City pavements may be made of earth, gravel, stone block, wood block, brick, asphalt, or broken stone.

4. A good street should be dry, solid, smooth, and without very steep hills.

5. The best way to lay dust and to preserve the road is to cover it with a coal-tar preparation.

6. Streets are cleaned by sweeping and sometimes by washing or flushing.

7. Electric and gas-lights are generally used for lighting streets.

8. The enforcement of the traffic regulations helps to make a city safe.

Questions. — 1. Can you mention some of the streets in the place where you live that are well-named?

2. How wide is the street on which the schoolhouse stands? The street on which your home is located?

3. How are the streets cleaned near your home? How often?

4. What are the advantages of clean streets?

5. What are the different ways of laying dust in use in the city or town where you live?

6. Can you make a plan of some street near the schoolhouse, and locate and name the shade-trees on it?

XVIII. THE DISEASES DANGEROUS TO THE PUBLIC HEALTH

"Life is not to live, but to be well."

Dangerous Diseases. — The diseases that are most dangerous to the public are those that spread from one person to another. For this reason they are called contagious diseases. The most common are consumption, pneumonia, diphtheria, typhoid fever, influenza, scarlet fever, meningitis, measles, and whooping-cough.

Their Cause. — Most of these diseases are caused by minute plants or germs. These are so small that they can be seen only through a microscope. The germs find their way into the human body, where they grow and multiply very fast. They are living plants which produce poisons, and it is these poisons acting upon the body that cause the illness. The paralysis of the throat in diphtheria, and the wasting away in consumption, are due to these poisons. In most cases each disease is caused by one definite kind of germ which is always present when a person is sick with that particular disease.

Another Condition. — The presence of certain disease germs is not the only condition necessary for an attack of illness. A strong vigorous person may carry the germs of disease in his body a long time without being ill. In such a case the body is able to keep them in

check. These germs require certain conditions of moisture, warmth, and food for growing and increasing in number. In addition the well person has the power to resist them. If a person is feeble, or in poor physical condition, the body loses this power. If the germs are present, and the conditions are favorable for them, they will thrive. Then the person has an attack of disease. A weakened condition of the body and the presence of the special germs are both usually necessary for an attack of a contagious disease.

Diseases of Different Seasons. — Certain diseases are more common at one season of the year than at other seasons. In the cold weather diseases of the respiratory organs, such as diphtheria, pneumonia, and influenza, are more frequent. These, however, are not due directly to the cold weather. During that season most persons stay in the house a large part of the time. Breathing impure air weakens the body, which then takes disease more easily. During the warm weather diseases of the digestive organs are common, especially among young children. These are due to extreme changes in the diet. The poisons produced by germs in unclean milk cause much sickness among young children.

Consumption. — Consumption causes more deaths in the United States than any other single disease. It is especially dangerous because most consumptives are ill a long time, and may give the disease to relatives, friends, and neighbors. Consumption is caused by definite germs, which live in the lungs, and gradually destroy them. All consumptives should be taught to

destroy their sputum while it is still moist. The most common way of taking the disease is by inhaling the dried sputum. In dusty streets, public buildings, and cars, this may mix with dust and become a real danger to many persons.

Pneumonia. — In some American cities pneumonia ranks first as the most deadly disease. Throughout the United States it ranks next to consumption. It is caused by germs that attack the lungs, causing inflammation or fever. The signs or symptoms of the disease may be like those of a severe cold. A pain in the chest, a sudden chill, quick breathing, and a flushed face warn a person of pneumonia.

A City Disease. — Pneumonia is a distinct disease of the house and the city. In the extreme North, persons may be exposed to the intense cold and to frequent wetting without taking the disease. The germs also must be present. Pneumonia is most common in winter or early spring, when the energy and strength of persons living in cities has been reduced by living most of the time for six months in hot and close houses.

A Disease of the Weak. — Pneumonia often attacks persons already weakened or recovering from some other disease. It attacks the underfed and the overworked. It also frequently attacks strong, able-bodied persons who are careless in regard to their health. Pneumonia attacks persons of all ages, but is most frequent among those from ten to thirty-five years of age. It is most fatal, however, among children under six years of age and among persons over sixty years.

Diphtheria. — Diphtheria ranks third in causing sickness and sorrow. This disease is due to a special kind of germ that attacks the throat. These germs form a virulent poison which causes the sickness. There is also danger of the germs stopping the air-passages. Diphtheria is most frequent among children from two to seven years of age. Persons over thirty seldom take it. The early symptoms are headache, general sickness, and a sore throat with red and gray patches on it.

How Spread. — One case of diphtheria is often traced directly to a previous one. The disease may be spread by breathing the air of the room used by the sick person. Sometimes clothing, dishes, toys, and books carry the germs. Infected milk frequently is a common cause. There are cases sometimes too mild to be recognized as diphtheria, and which pass for sore throats. Such persons are often a dangerous means of spreading the disease as they go freely about.

Antitoxin. — One of the greatest discoveries in medicine during the last century was the discovery and use of antitoxin in the treatment of diphtheria. This treatment has saved many lives. Formerly half of the cases of diphtheria all over the world were fatal. Now only nine out of every one hundred cases are fatal. In special hospitals the rate is as low as three out of every one hundred cases. Recovery is much quicker when antitoxin is used, and its early use does the most good.

Typhoid Fever. — Typhoid fever is a disease of adult life. About three quarters of all the cases occur in

persons between fifteen and forty years of age. Among children it is mild, and often not recognized. A person seldom has the disease more than once. Typhoid fever is caused by a definite kind of germ which is always taken into the body by the food or water, and hence invades, at first, the intestinal tract.



Diphtheria Typhoid Fever

GERMS OF DISEASE, HIGHLY MAGNIFIED

How Carried. — A case of typhoid fever may often be traced to a previous one. There are several ways in which the germs may be carried, namely: by water, by milk, by raw vegetables, by fruit, by oysters, by flies, and by being near a person who has typhoid fever. Probably more than three quarters of all the typhoid fever is caused by germs in impure drinking water. Even some of the cases traced to milk are caused by the water either put into the milk or used in washing out the milk-cans. This shows how important it is to use pure drinking water in city or country. The disease may also be spread by dairymen who send their milk to the city. The Board of Health of New York City has been very careful to require, every week, a certificate of health from all dairymen. As a result, during the last five years there has not been a single epidemic of typhoid fever in New York City that could be traced to the milk supply.

Influenza. — Probably influenza has been one of the best known diseases during the last ten years. An

attack may be very mild, lasting only a few weeks, or it may be very serious or even fatal. It often occurs with pneumonia during the cold weather. This disease is also caused by a germ, so that it may spread from person to person. The first symptoms are somewhat like those of a severe cold or pneumonia. A chill, fever, cough, and general pains mark the beginning.

Importance of the Disease. — It is important to recognize influenza from the first, since the early symptoms are so much like more serious diseases such as pneumonia. Influenza often occurs in connection with other diseases. When influenza is common, other diseases like bronchitis, pneumonia, and consumption are much more severe and fatal.

Scarlet Fever. — This is a serious disease of childhood. Most young persons under fifteen years of age are likely to take the disease if exposed to it. Scarlet fever is very contagious. Only two other diseases, measles and small-pox, are more easily taken. The minute scales given off from the body carry the disease. There is danger from mild forms that are not recognized. These persons may give the disease to others at school, in the cars, and wherever they meet them.

How Identified. — Scarlet fever comes on suddenly with a chill, a sore throat, headache, and nausea. In a few days the red color of the skin is characteristic. Any child with such symptoms should be kept away from other children, and immediately receive medical care. The spreading of the disease can only be prevented by keeping the sick persons away from the well,

and by thoroughly disinfecting all the articles that are in the sick room. Some of the worst features of the disease are the after effects upon the eyes and ears.

Meningitis. — One of the most dangerous of contagious diseases is meningitis. This also is most common among persons under thirty years of age. It occurs often in the crowded districts of cities, and in winter or spring with pneumonia. This disease is caused by germs which attack the covering of the brain and spinal cord. It may be taken by one person from another who is ill with it. It is not as contagious as measles or scarlet fever, which may be taken from the air of sick rooms.

Measles. — This is one of the most common diseases among children. While most persons have measles but once, it is possible to have them a second time. The early symptoms are headache, sore throat, cough, and an eruption in the throat or on the face. It is very contagious. A person may take it directly from another person or simply from being in the room with the sick one.

Whooping-Cough. — The course of this sickness may be long and tedious, although not very serious. The chief features are the spasms of coughing ending in a peculiar whoop. Being with the sick for only a very short time exposes one to the disease.

Children's Diseases. — Among the diseases common to childhood that have already been described are measles, diphtheria, scarlet fever, and whooping-cough. Others are mumps, chicken-pox, and German measles.

These not Necessary. — Formerly every one thought

that it was best for children to have the different children's diseases when they were young, and "be through with them." No pains were taken to keep well children away from the sick. Children were even exposed to them purposely. As a result there was loss of time, money, and life. Many children were disabled or weakened for life, and many never reached their fifth birthday. Now it is known that the safest way is to keep children well and strong, and to keep them away from all contagious diseases

How to Prevent Children's Diseases. — Many of the diseases common to childhood are due to germs. One of the chief means of preventing such diseases from spreading is to keep all well children away from the sick. Another necessary precaution is to disinfect or kill the germs on all objects that the sick have used. In some cities school-physicians and nurses care for the health of public school children. If a child appears ill the physician examines him. If really ill he is immediately sent home, and the nurse sees that he has proper care. In this way children are taken from school when they first become ill, and are prevented from spreading a contagious disease among their schoolmates. A clean mouth and whole teeth aid in keeping well, as the germs often enter the body by way of the mouth. In some cities school children may have their teeth attended to free of charge, if their parents are unable to pay a dentist. A clean face and hands also help in keeping the germs out.

How Contagious Diseases Spread. — The reason that

contagious diseases are so common is that they are carried in numerous ways. Many persons also are ignorant and careless in the matter. One of the most common ways of spreading diseases is through the air. On a dry windy day, clouds of dust may be blown into our faces. Since there may be many kinds of germs mixed with the dust, is it any wonder that sometimes we take diseases without knowing where they come from? Clean, dustless streets are a necessity in promoting the health of the public. Sometimes a person coughing or sneezing near us is a source of danger. Every one should hold his handkerchief before his face when coughing or sneezing.

Water as a Carrier of Germs. — Impure drinking water has caused a great amount of sickness and expense, and many deaths. Water may carry disease germs long distances. Cities and householders should take the greatest care to secure pure water and to keep it from being contaminated. When there is any question of danger from drinking water it should be boiled, and then cooled before being used for drinking. Sometimes a second boiling is necessary when the water is very dangerous. The diseases most commonly carried by water are typhoid fever, dysentery, and cholera.

Food as a Carrier of Germs. — Food, especially milk and meat, has caused an enormous amount of sickness. The attempts to obtain clean food and milk will lessen the danger in the future. The utmost care and cleanliness in connection with the dairies, cows, milkers, and milk, will secure safe milk. Rigid inspection and

the enforcement of health laws will help to keep foods clean and free from disease germs.

Animals as Carriers of Germs. — It is known that animals may suffer from diseases, and cause the same trouble in persons. Any one eating the uncooked meat of animals suffering from certain diseases may have the same diseases. This is the reason for strict meat inspection. It is also probable that tuberculosis may be carried from cows to men by meat, milk, butter, and cheese. Hence the need of laws and inspection to insist that all dairy cows shall be in good health. Insects are the means of carrying germs from objects or individuals to other persons. Flies carry typhoid fever, and mosquitoes carry malaria and yellow fever. Oysters also may carry germs when they have been taken from polluted waters.

Course of the Illness. — If a person takes a contagious disease it will run its course, although proper care and treatment may lessen the danger, and prevent serious results. If any one is exposed to the germs of a contagious disease, either in the air, the food, the water, or by animals, and if he is in the right condition, he takes the disease. He may not know it at the time. Then a certain length of time is necessary for the germs to increase in number in the body before the symptoms of the disease appear. This time is called the incubation period. As the germs grow they create a poison which causes the sickness. If the body is able to resist this attack of germs, the person gradually recovers.

The Incubation Period. — The time from taking a

disease to the appearance of the early symptoms varies with different diseases from two days to two or more weeks. During this time, in many cases one may give the disease unconsciously to others. If a child has been exposed to scarlet fever or diphtheria, he should be kept away from other children until the disease has had ample time to show itself.

INCUBATION PERIODS

Chicken-pox, 14 days
Diphtheria, 2–8 days
Influenza, 2–3 days
Measles, 13–15 days
German measles, 1–3 weeks
Mumps, 16–25 days
Pneumonia, 1–2 days
Scarlet fever, 1–7 days
Small-pox, 11–12 days
Typhoid fever, 2–3 weeks
Whooping-cough, 1–2 weeks

Reporting to the Board of Health. — In most of the states the law requires that every case of a contagious disease shall be reported by the attending physician or the householder to the Board of Health. This is very essential, so that the health authorities may properly isolate or quarantine each case.

Quarantine. — Immediately the health officer posts upon the house a plain notice giving the name of the disease. He also serves a quarantine notice upon the head of the family. Usually all the members of the family who have been exposed to the disease are quarantined until the disease has had time to show itself. Persons are forbidden to leave or enter the quarantined house. The isolation may be more or less strict, according to the disease and the means of caring for the sick.

Disinfecting. — After isolating the sick the next step is to kill the disease germs that may be on any object leaving the sick room. This is disinfecting. The different materials that will kill germs and so are good disinfectants are sunlight, dry heat, boiling water, live steam, carbolic acid, chloride of lime, washing-soda, formaldehyde, sulphur, sulpho-napthol, and many others. The choice of a disinfectant will depend upon the article to be disinfected, and upon the cost and the effect of the disinfectant. All white clothing from the sick room may be thrown into boiling water containing carbolic acid. Toys, books, and articles of little value are best burned. After recovery the entire room with its furniture must be fumigated with sulphur or formaldehyde before it is used by any other person. Sunlight is one of the cheapest and most thorough disinfectants if the germs can be exposed directly to its action for half an hour. Most disinfectants are dangerous poisons, and should be so labeled and kept out of the reach of young children.

School Attendance. — It is important that children suffering from contagious diseases should be kept out of school. Not only is the sick person excluded but also the other members of the family. Sometimes in tenement houses all of the families on the same floor are quarantined. Otherwise a large number of children would be exposed. In case of an epidemic it may be necessary to close the schools to prevent further spreading. The children are not allowed to return to school until some time after the home is disinfected and the

warning sign is removed. The exact time varies somewhat in different cities. The school or health authorities would be glad to inform any one of the rules in this matter on applying to them.

Quarantine Stations. — A very extensive system of quarantine is maintained by the United States Government to keep contagious diseases out of this country. Fifty medical officers are engaged at forty-four separate quarantine stations located at the chief ports of entry along the Pacific, Gulf, and Atlantic coasts. During a single year, 16,766 vessels and 1,433,134 persons have been inspected and 1603 vessels disinfected.

The Quarantine of Ships. — The city of New York has one of the most complete and efficient quarantine stations in the world. As an ocean steamer from an infected port enters the Lower Bay, it comes to anchor off Sandy Hook. Here is located the lower quarantine anchorage, which is marked by yellow buoys and a ship moored for a floating station. The arrival is signaled to the main quarantine station six miles above on Staten Island, and soon a swift tug bears the quarantine officer down the bay. He examines all on board, passengers and crew, and the general condition of the steamer. He also calls for the bill of health. If all is well, the vessel continues on its course to the Upper Bay to land its passengers and cargo.

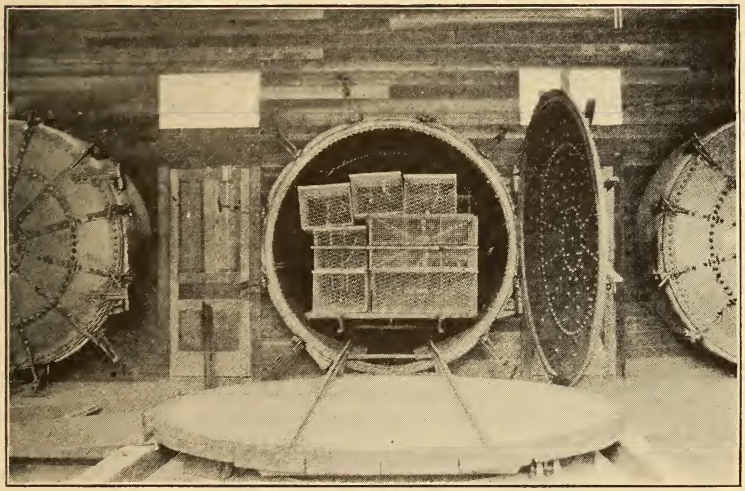
The Quarantine of Persons. — If persons are discovered ill with cholera, plague, or certain other contagious diseases, they are removed to the hospital on Swinburne's Island in the Lower Bay. The persons

who have been exposed to the disease are taken to Hoffman's Island. Here their baggage is disinfected and they are isolated and detained a few days until the disease has had time to develop. If ill, they are cared for at the hospital. If no disease develops they may leave for New York City. The vessel and its contents must then be thoroughly disinfected. The main offices and headquarters of the quarantine station, situated on Staten Island, are equipped with disinfecting apparatus, laboratories, and many other facilities for this important work.

Keeping Cholera out of the United States. — A striking example of the prevention of the spread of disease from one country to another is the exclusion of cholera from the United States in 1911. When cholera first appeared in Russia in May, 1910, the Surgeon General was notified by the representative of the United States in Russia. He notified the officers at the various ports, both abroad and in this country, to be watchful and strict in enforcing the quarantine laws. Immigrants who were bound for America from cholera-infected ports were detained for five days before embarking and their baggage was inspected. In addition the ship's surgeon was required to inspect all immigrants twice daily. On arrival at the port of entry the quarantine officer examined each person and his baggage. If well, the immigrants were allowed to proceed on their way.

Continued Oversight. — They were, however, still under observation. A destination card was made out for each immigrant by the quarantine officers, giving

the name, place of departure, and destination of the person. The card was forwarded to the Board of Health of the state where the person intended to live. The State Board forwarded the card to the local Board, who could do what was necessary for the protection of



Disinfecting Clothing at a Quarantine Station

Steam or formaldehyde gas is turned into the steel tubes containing wire cases of clothing

the public. Only five or six cases of cholera developed outside of quarantine, and these were quickly handled. By efficient and thorough work at quarantine stations cholera was kept out of the United States.

Summary. — 1. The contagious diseases are those most dangerous to the public health.

2. Keeping well and strong and avoiding persons sick with contagious diseases are the best means of preventing sickness.

3. Among the most fatal contagious diseases are consumption, pneumonia, diphtheria, typhoid and scarlet fevers.

4. Children should be protected from children's diseases instead of being exposed to them.

5. Contagious diseases may be spread by the air, by water, by food, by animals, and by being near the sick.

6. Contagious diseases may be prevented by isolation and disinfection.

Questions. — 1. Why does not a person become ill as soon as he takes a disease?

2. How long must children ill with contagious diseases stay out of school in the state where you live?

3. What is the value of antitoxin in the treament of diphtheria?

4. How do school-physicians and nurses prevent sickness?

5. What precautions are necessary when a person is isolated on account of a contagious disease?

6. What are some of the best ways of disinfecting?

XIX. THE GREAT WHITE PLAGUE — TUBERCULOSIS

God lent his creatures light and air,
And waters open to the skies;
Man locks him in a stifling lair
And wonders why his brother dies.

Oliver Wendell Holmes.

What Tuberculosis is. — Tuberculosis is a very common disease and causes a great amount of suffering all over the world. It has been called a plague because it has killed nearly as many people as the plagues of olden times. Unlike them, it is still silently, slowly, but surely, working all of the time.

Different Forms of Tuberculosis. — Tuberculosis is a very old disease and many of its forms have been known under different names. Tuberculosis of the lungs, called consumption, is the most common form. Nearly nine tenths of all tuberculosis is consumption. Tuberculosis of the hip is called "hip-joint disease." Tuberculosis of the glands of the neck is known as "scrofula." Both of these forms are found among children. There is also tuberculosis of the bones, of the throat, and of many other parts of the body.

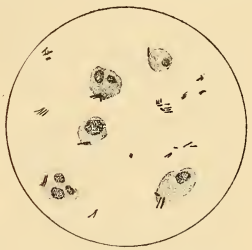
Cause of Tuberculosis. — It is caused by a germ so small that it can be seen only under a microscope. It takes 3000 of them, put end to end, to measure one inch. This germ was discovered in 1882 by the great German

physician, Dr. Robert Koch. The germ grows and increases in the human body, and destroys the part where it is located. It can only grow, however, under certain conditions. Darkness and dampness are absolutely necessary for its growth. Dryness, fresh air, and sunlight are unfavorable to it. Direct sunlight will kill the germs in twenty minutes. When these germs are able to gain an entrance into a delicate body, they grow rapidly, and the person has tuberculosis.

What Tuberculosis Does. — Tuberculosis kills more people in the United States than any other single disease. Eleven per cent of all the deaths are due to this cause. In our country 150,000 persons or more die annually from this disease. This means that one death from it occurs in every three minutes. We talk of the terrible loss of life during wars, but have become accustomed to the great loss from tuberculosis. In the four years of our Civil War there were killed and mortally wounded from 155,000 to 161,000 men. This is not much more than the number who die *annually* from tuberculosis in this country. In terms of dollars and cents this means a great financial loss to the country. In New York City alone, it is estimated that the annual loss from tuberculosis is $23,000,000.

Who are Attacked. — The rest of the story is the saddest part of it. Consumption attacks neither the youngest nor the oldest persons. It attacks those from fifteen to forty years of age. Often it disables the breadwinner of the family. More than one fourth of the deaths occurring among young people are due to consumption.

The Early Symptoms. — It is very important that the early signs or symptoms of the disease should be well known. If the disease is discovered early and the proper treatment obtained, a large per cent of consumptives recover their health. Every one thinks of a racking cough when consumption is mentioned. In the early stage there may be very little coughing, with no expectoration. Growing thin, and losing the appetite and strength are early indications. Breathlessness when hurrying is sometimes present. Often a person has a flushed face and rise of temperature in the afternoon. Perhaps he feels tired or run down. The only safe thing to do when a cough lingers week after week is to have the lungs examined by a reliable physician.



CONSUMPTION GERMS
From the sputum of one having the disease. Highly magnified (From Huber's Consumption)

A Contagious Disease. — Since the discovery of the cause of the disease, tuberculosis has been known to be contagious. By this we mean that one person can take the disease from another. It is not as quickly contagious as the measles or scarlet fever. But persons living in the same family with a consumptive are likely to take the disease unless proper precautions are taken. There is danger in using dishes, towels, and clothing of a consumptive. The other members of the family need to be protected in every way, or the consumptive should be cared for at a hospital.

How the Disease is Spread. — Tuberculosis is usually

carried in one of two ways. A person may inhale the germs or he may take food or milk that contains them. The sputum of all consumptives contains large numbers of germs. If these are allowed to dry they escape into the air and may be inhaled by others. The consumptive should always hold a handkerchief before his mouth when coughing. He should be trained to use a sputum cup, damp cloth, or paper napkin. These should be burned or boiled before drying. A careful consumptive need not give the disease to others, but a careless consumptive is a real danger in spreading the disease.

Laws Against Spitting. — Since tuberculosis is a very common disease, there is grave danger to the public. Many states have passed laws forbidding expectorating on sidewalks and in street-cars. These laws should include all public buildings and public places. Occasionally fines are imposed for the violation of these laws. But it is evident that the public must be educated to appreciate cleanliness and healthfulness before substantial results will be obtained.

Spread by Food. — All food that is much handled during its preparation or sale is liable to contain the germs or become infected if there is a consumptive among the employees. So it is necessary to inspect bakeries and factories and all persons who work in them. All foods like bread which are handled in selling should be wrapped in oiled paper. Impure milk has long been considered an important source of the disease, especially among young children. All farmers

furnishing certified or high-grade milk must have their cows tested for tuberculosis. Physicians are uncertain whether the tuberculosis of animals is identical with that of man. It is safest, however, not to use the milk of tuberculous cows, especially for young children.

Conditions for Spreading. — There are many conditions favorable for the development of the disease. In poor houses, where the rooms are overcrowded, there is much tuberculosis. Sometimes poor food and defective teeth weaken the body so that it takes tuberculosis easily. The use of alcohol and a serious illness of any kind may also reduce the bodily strength. Certain occupations, like stone-cutting, cigar-making, and polishing where there is much dust, are likely to injure the lungs.

Tuberculosis may be Prevented. — It is fortunate that all of the measures that tend to prevent tuberculosis are those of a well-regulated and healthful life. Wholesome food, plenty of fresh air, cleanliness, and vigorous strength are safeguards against the disease. Persons should never sleep, live, or work in dark or badly ventilated rooms. All persons should be taught to keep their bodies in such physical condition as to enable them to resist the germs. The public must be instructed in the cause, prevention, and cure of the disease.

How to Avoid Spreading the Disease. — More direct work should be done in removing the advanced and dangerous consumptives to hospitals, where they cannot give the disease to others. Every consumptive should

be taught how to destroy his sputum and how to avoid giving the disease to his family, neighbors, and friends.

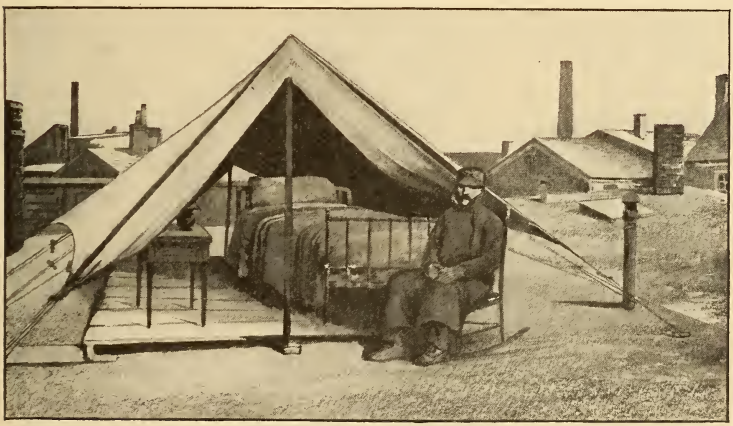
The Work of Health Officers. — Every case of tuberculosis should be reported to the Board of Health. If the disease is discovered and cured in the early stages it will not spread. All rooms should be disinfected after consumptives have lived in them. This is important, as experience has shown that the germs may linger in the wall-paper and cracks of a room and give the disease to others.

Tuberculosis not Inherited. — Many persons think tuberculosis may be inherited by a child, but it is not so. A child may have weak lungs or a weak body on account of the disease of a parent. He may inherit a tendency to the disease, but not the disease itself. Among such children there are many who are sickly. When they are exposed to tuberculosis in the family they take the disease easily, sometimes before the parents know it. The children of tuberculous parents should receive special care until they are well and strong.

A Curable Disease. — One of the most encouraging phases of the entire problem is that tuberculosis has been cured, and is being cured today. If consumption is discovered in its early stage, and the right treatment begun, the chances for recovery are good. Seventy per cent of such cases have apparently been cured, or the disease "arrested" or stopped. The cure of consumption depends upon plenty of fresh air, nutritious food, cleanliness, and rest. Taking a cure usually

requires one, two, or three years. A happy result often depends upon courage, patience, and perseverance.

Treatment at Home. — The successful treatment depends upon securing the four essentials of fresh air and sunshine, nutritious food, cleanliness, and rest under the conditions of home life. The sunniest room



Living in the Open Air

of the house is given to the consumptive and is fitted up in the most sanitary manner. As little furniture as possible is used, with thin white curtains and a rug or two. These are easily cleaned and aired.

Obtaining Fresh Air. — Every effort is made to be out-of-doors as long as possible, both day and night. During the day the patient may sit in a reclining chair on a piazza or balcony. He may be covered with furs so as to be comfortable in the coldest weather. It is a very common practice for consumptives to sleep out-of-doors at night. Sleeping balconies, tents,

and shacks are often erected for this purpose. When these cannot be obtained window-tents may be used. Extra protection by mattresses, blankets, puffs, hoods, and sweaters keeps the patient warm. The most convenient arrangement is to have the sleeping balcony open directly out of the chamber, which may then be used for dressing. Roofs of houses, backyards, piazza roofs, and many other protected places are used for sleeping out-of-doors. In the summer patients may stay out as many as sixteen hours of the twenty-four.

Nutritious Food. — Fresh air alone will never accomplish a cure. Plenty of nutritious, easily digested food must be taken to build up the strength. Most consumptives, at first, are thin and weigh less than they should. Three good substantial meals at eight, one, and six o'clock are usually not enough. Three or four lunches between meals are also given, until the patient gains his normal weight. Life in the fresh air creates a fine appetite. Milk, eggs, meat, vegetables, fruit, and bread and butter are heartily relished.

Rest and Exercise. — The third necessity for cure is rest. At first absolute rest of body and mind is necessary. After recovery has begun, light reading, quiet games, and friends are permitted. Reclining in an easy chair is the daily occupation. Rest is essential to give the lungs an opportunity to recover. After a time, on the advice of the physician, the patient begins to exercise, and a very short walk in the forenoon is allowed. As the strength increases, longer walks and light occu-

pation may be permitted. Over-exercising has killed many consumptives.

Cleanliness. — Warm baths for cleanliness should be insisted upon once or twice a week. It is also important to wash the hands before eating and to brush the teeth after eating. Cold baths are also used to harden



At a Sanatorium

the body against the disease. The bath increases the appetite, stimulates the body, and makes it easy to resist the cold and the changes of out-of-door life.

Hospitals. — There are many hospitals or sanatoriums in the United States for the cure of consumptives. The first state sanatorium in this country was built in 1898, at Rutland, by the state of Massachusetts. Since that time fourteen other states have established hospitals. The charges vary in amount up to $7.00 per week. There are also many private sanatoriums for consump-

tives located among the mountains and in the clear air of Colorado. Other hospitals are supported by cities, private associations, or religious societies. In the United States there are about four hundred special hospitals where consumptives only are received.

Sanatorium Treatment. — In sanatoriums every opportunity is offered the patients to recover. Plans are made for living in the open air, abundant food is provided, and rest is insisted upon. Exercise is taken under the care of the resident physician. The time of each patient is carefully planned for him, from rising in the morning until retiring at night. Most of the patients gain health and strength, and this makes them happy and eager to help on the cure.

Tuberculosis in Children. — Tuberculosis is common among children, yet many of them could be strengthened to escape the disease if they had the proper care. The well-nourished are not so liable to be attacked as delicate children. Open-air schools, playgrounds, excursions to the country, sanatoriums, and hospitals are all helping children to escape this disease. There are also exhibits which go from school to school to teach children how to avoid tuberculosis.

Rules for Children. — 1. Get plenty of fresh air; keep your window open at night, whatever the weather may be.

2. Do not sleep in a current of air.
3. Do not allow any one to kiss you on the lips.
4. Do not stay near any one who has a cough.
5. Do not spit.

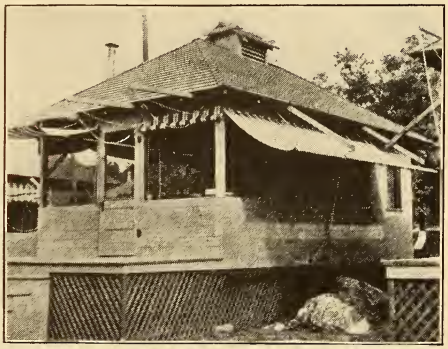
6. Always hold a handkerchief over your mouth and nose when you cough or sneeze.

7. Take a warm bath once or twice a week and a cold bath when possible every morning.

8. Do not lie on the bed with a sick person.

9. Avoid children who have any contagious disease.

10. Do not put into your mouth things that others have had in theirs, such as whistles, spit blowers, chewing gum, and pencils. Do not bite from the same apple that some one else has been eating.



A Simple Shelter for a Consumptive

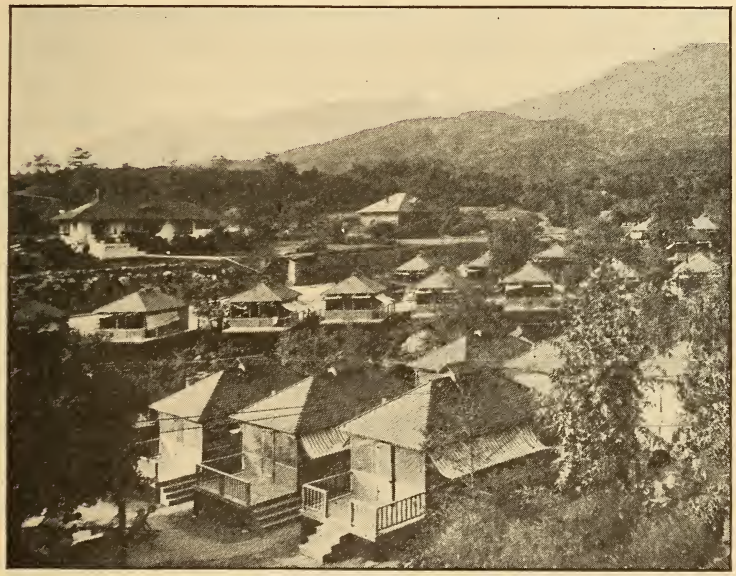
The Cured Consumptive. — If the rest cure has been successful, the consumptive is apparently cured. This does not mean, however, that he is able to return to his former occupation under unfavorable conditions. Many consumptives have done this to their sorrow and have broken down completely. The cured consumptive must continue to live with care. In many instances he continues the habit of sleeping out-of-doors. Often he is unable to return to his former employment and must seek light work in the open air. Experience has shown that for two or three years the cured consumptive must live a most hygienic life if he wishes to retain his health.

The Fight against Tuberculosis. — Throughout the civilized world to-day there is a great effort being made to fight tuberculosis. This international movement is sometimes called the "crusade" the "warfare" or the "struggle" against tuberculosis. The general methods are similar in all nations, but adapted to the habits of different people. An immense sum is spent annually to carry on the fight. In 1910 the sum of $15,000,000 was spent in the United States for this cause.

The Work of Hospitals. — The work of hospitals in the fight against tuberculosis is of two kinds. Some hospitals take only incurable consumptives. These are very important, for they prevent the consumptive from being the means of giving the disease to his family, his friends, and many others. Preventing persons from taking the disease is one of the chief means of suppressing it. Other hospitals take only the early and probably curable consumptives. The persons cured at these hospitals are usually able to resume work and their places in the community. They become important centers in spreading information on the cure of consumption and on hygienic ways of living.

The Tuberculosis Dispensary. — Many large cities maintain dispensaries for the recognition and treatment of tuberculosis. Here any one unable to pay for medical advice can be examined for tuberculosis without charge. If he is suffering from this disease, he is assisted by advice, treatment, or help to carry out a cure at the city or state hospital. There are nearly three hundred such dispensaries in this country.

Day-Camps. — Some cities and societies carry on day-camps for consumptives. A camp is usually located in the open country, but within easy reach of the city. It consists of a kitchen, a dining-room, an office, a rest-



A Cottage Camp for Consumptives

room, and many reclining chairs. The patients spend the day only at the camp, receiving two or three substantial meals. Most of the time is spent resting in the sunshine. These camps have done much good among consumptives who have no place where they can sit out-of-doors at home, and who are able to stand the trip back and forth night and morning.

Night-Camps. — The night-camp is especially helpful to the consumptive who has left the sanatorium as cured.

He may be able to work in the city during the day, but is totally unfit to return to his crowded home. The night-camp is only for men who may go to the city every day. It consists of a dining-room, kitchen, and shacks open on one side, with accommodations for many men.

Tuberculosis Classes. — It has been shown that it is possible to treat a group of consumptives while each one is living in his own home. The class is under the direct charge of a physician, a nurse, and friendly visitors. Once a week the members of the class meet, when the physician inspects them and gives them advice. The nurse visits their homes and helps them to obtain the necessities of fresh air, nutritious food, and a place for rest. The friendly visitor encourages them and helps them financially when necessary.

Societies. — Since 1905 a National Society for the study and prevention of tuberculosis has been teaching the public about this disease. It has helped in the establishment of four hundred anti-tuberculosis societies in the United States. It has also sent out circulars on subjects connected with the cure and prevention of tuberculosis. There are also many other local societies doing a similar work.

The Red Cross Society. — A department of the Red Cross Society is fighting against tuberculosis. The Red Cross stamps or seals issued every Christmas are excellent means of reaching the people and of raising thousands of dollars for the cause. The money from this source has made possible the establishment of the Red Cross Tuberculosis Camps in Cleveland and on the roof

of the Vanderbilt Clinic in New York City. "Every stamp means a bullet in the fight against tuberculosis." At Christmas, 1910, there were 40,000,000 seals sold throughout the United States.

Traveling Exhibits. — A traveling exhibit on tuberculosis is one of the best ways of educating the public. Such an exhibit consists of photographs, models, charts, and all kinds of objects that have to do with the prevention and cure of tuberculosis. Tents, chairs, and all possible aids are included. Such exhibits are owned and loaned by the Tuberculosis Societies and by State Boards of Health. When such an exhibit is set up in a hall in a large city and duly advertised, it is visited by thousands of persons daily.



Red Cross Stamp

Educating the Public. — Lectures on tuberculosis are often given and lantern slides loaned in the attempt to spread knowledge of the prevention and cure of this disease. The help of the churches is sought throughout the country. Many preachers now set apart one Sunday or one meeting during the year for a sermon or lecture on this subject.

Mottoes. — One of the easiest ways of reaching the public is by means of mottoes. These are printed on white cardboard and are posted in conspicuous places. Some of the mottoes read as follows: "Keep well and so resist tuberculosis," "Keep the body clean and a cheerful mind," "Worrying doesn't mend matters," "Take time for regular rest, exercise, and recreation."

Results of the Crusade. — This crusade has been of the greatest value in teaching the mass of the people the necessity of fresh air, nutritious food, cleanliness, and rest. It has helped to obtain better tenement houses, playgrounds for children, and many health laws. The result in the reduction of the number of deaths from tuberculosis is very hopeful in all civilized lands. About one half as many persons die of tuberculosis today as did fifty years ago.

Summary. — 1. Tuberculosis is a contagious and a curable disease. It may also be prevented.

2. This is the most common disease in the United States.

3. The early symptoms are a persistent cough, loss of weight, strength, and appetite, and a flushed face.

4. Only a weakness or tendency to tuberculosis can be inherited.

5. Tuberculosis can be cured if it is discovered early and the right treatment carried out.

6. The essentials of the cure are fresh air and sunshine, nutritious food, cleanliness, and rest.

7. The fight against tuberculosis extends all over the civilized world. It includes the work of hospitals, dispensaries, camps, classes, societies, and exhibits.

Questions. — 1. What is the cause of tuberculosis?

2. What harm does this disease do?

3. How is consumption spread?

4. What will help to prevent tuberculosis?

5. How can persons obtain plenty of fresh air? Why are wholesome food and rest necessary for a cure?

6. What is being done to help tuberculous children?

7. What may all children do to avoid the disease?

8. What are some of the results of the war against tuberculosis?

XX. THE PREVENTION OF DISEASE

"Prevention is easier than cure and far cheaper."

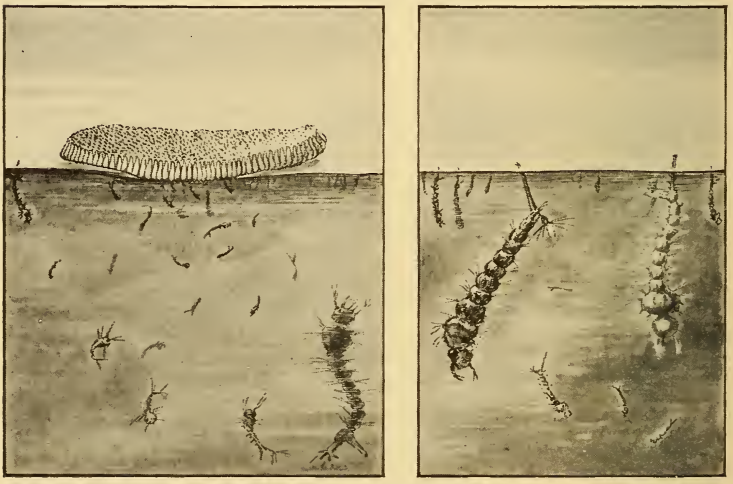
Preventable Diseases. — All diseases that are caused by germs might be prevented if we could keep well and strong and could avoid the germs. But keeping the germs away is no easy matter. We may be able to avoid a few persons whom we know to be ill, but we are likely to meet others on the street, in the cars, at school, at church, at the theatre, and in any public place. Health authorities must do their part to secure the isolation of all such persons as are likely to spread diseases.

Fighting Diseases. — The well-organized campaign against tuberculosis is, perhaps, the best known in the fight against disease. Much has already been done in the prevention of malaria, yellow fever, typhoid fever, and small-pox. In order to understand how these diseases may be prevented it is necessary to know something of their causes and of their means of spreading.

Malaria and the Mosquito. — Malaria is caused by a very small animal or parasite that lives in the blood of the afflicted person. One kind of mosquito, the marsh mosquito, carries this parasite from the sick to the well. In biting a person having malaria, the mosquito sucks in some of these parasites with the blood. Then, when it bites the well person, these parasites escape into the opening made by the bite. A person with malaria may

give it unconsciously to many others if mosquitoes are allowed to bite him. For the prevention of malaria, then, the measures must apply to the persons suffering with the disease as well as to the mosquitoes that may carry it.

The Malaria Mosquito. — The marsh mosquito that

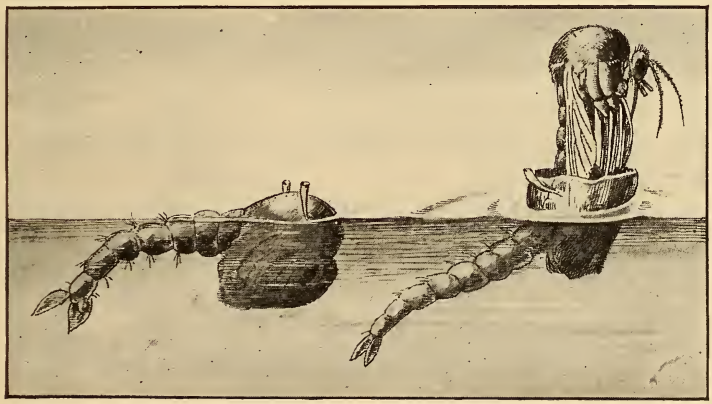


Mosquito Eggs and Larvæ

carries malaria is large in size and is found in the long grass on the margins of marshes, lakes, ponds, and rivers. The tiny eggs float on the surface of the water and soon develop into small larvæ about one quarter of an inch long. These lie close beneath the surface, for they must obtain the air above for breathing. After a few days they change into another form called the pupa, identified by a very large head. After five or ten days changes take place within the pupa, and the

adult mosquito escapes from the empty skin. All of the early life of the marsh mosquito, then, is spent near the surface of water.

Destroying the Mosquitoes. — The mosquito may be killed by destroying either the early forms or the adult. The fight against mosquitoes must begin by locating the places where they breed. A search in



Pupa and Adult Mosquito

stagnant water in malarial districts will usually show the larvæ. Disturbing the grass near by will probably start up a swarm of mosquitoes. Whenever possible, low, wet places should be drained, and the long grass cut. Low places may sometimes be filled in with soil. Destroying the breeding places is the first and the most important measure in fighting mosquitoes.

Oiling Ponds. — When it is not possible or desirable to drain a pond, the young mosquitoes may be killed while in the water. For this purpose kerosene oil is

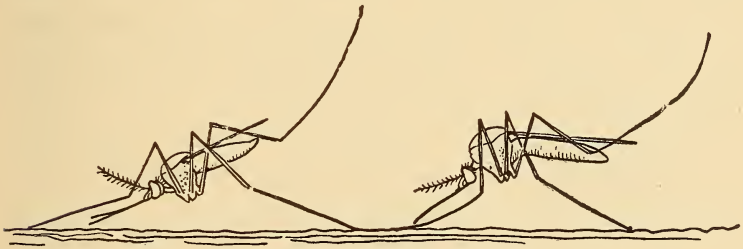
spread on the surface. The oil forms a layer on the top of the water and suffocates the larvæ just below. It also destroys many mosquitoes which may be flying near the water, as well as the floating eggs. Oiling should be done every two weeks as the kerosene gradually evaporates.

Fish and Mosquitoes. — Another way of clearing a pond or lake of young mosquitoes is to stock it with small fish. Goldfish and minnows have proved useful for this purpose. These readily eat the young mosquitoes and keep the pond free from them. This is a very useful method in small pools and fountains in gardens and yards.

Avoiding Mosquitoes. — It may be possible and it is always desirable to select for a home a spot that is high and located some distance from marshy regions. No stagnant water should be allowed near any building. Proper drainage or the filling of the low places should remove the surplus water. Screening of windows and even verandas is usual and necessary if mosquitoes are abundant. Sleeping under mosquito nets is an additional safeguard.

Anti-Mosquito Laws. — Laws against breeding mosquitoes are sadly needed in many places. This is certainly as annoying and dangerous a nuisance as many others suppressed by law. Only one state, New Jersey, has made a beginning in this direction. Every one should know how to help in the work. Papers and books tell the story. Pamphlets upon the subject may be obtained from the National Government.

How to Suppress Malaria. — Malaria may be prevented in four ways. First, all of the marsh mosquitoes near dwellings should be killed, as these mosquitoes carry the disease. Second, the bites of all those mosquitoes that carry malaria should be avoided. Third, all persons suffering from malaria in houses or hospitals should be screened, so that the mosquitoes cannot bite them. Fourth, the drug quinine should be taken. In



Mosquitoes in Resting Position
On the left the malarial mosquito (*Anopheles*); on the right the harmless mosquito (*Culex*)
(From Howard's Mosquitoes)

fighting malaria all of these measures are used, since it is impossible to carry out any one method thoroughly enough, with a large number of persons, to suppress the disease. In malarial regions mosquito brigades search for stagnant water, while health officers give quinine to every one who can be induced to take it.

Fighting the Mosquitoes in Panama. — The extermination of mosquitoes in Panama made the canal possible without enormous loss of life. The prevention of malaria and yellow fever in that district is one of the most notable recent triumphs of any government in this field. The French began to build the canal, but

after a loss of 50,000 men they gave it up. In 1904 the United States took over the administration of the Canal Zone and undertook to build the canal. Instead of rebuilding the French hospital, a chief sanitary officer was appointed to prevent the two diseases, malaria and yellow fever, that had been so fatal to the French. With 6000 men and $5,000,000 he started out to exterminate the mosquitoes near the dwellings and so make it safe to live there. The chief work has been done in draining all lakes and swamps and cutting the weeds from the margins. The grass of meadows is kept short within three hundred feet of all dwellings, which is as far as mosquitoes can fly. Kerosene is freely used on ditches and pools where stagnant water might collect. This has been followed by a careful house-to-house inspection to prevent as much as a pailful of stagnant water which might offer a breeding place for the mosquitoes. The houses also are screened to keep out the dreaded insects. The practice of killing any stray ones to be found within the houses is insisted upon. To enforce these measures a forty-five-mile strip along the line of the canal is under strict sanitary regulations and inspection. Other health measures also have been introduced. These have all helped to make the Canal Zone a safe place to live in.

In the United States. — The loss in this country annually from malaria is not less than $100,000,000. Measures for the extermination of the malaria mosquito have been carried on in many isolated places. Work on the largest scale has been carried on by the state of

New Jersey. A large part of the state has been mapped with reference to the breeding places. In all, 25,000 acres of marsh land, including a shore line of nearly seventy miles, have been reclaimed by over 3,000,000 feet of ditching.

How Boys and Girls can Help. — In San Antonio, Texas, a panic seized the city on the discovery of a few cases of yellow fever. Efforts were started on a large scale to teach the school children and through them their parents about insects as carriers of disease. Aquariums were fitted up in the schoolrooms, and the eggs, larvæ, and pupæ of mosquitoes were studied. Excursions were made to search for breeding places, and classes rivaled each other in trying to report to the Board of Health the largest number of such places. Lessons were given on the subject, and papers were written by pupils. As a result there was a decided decrease in the number of mosquitoes in San Antonio. While formerly there were from fifty to sixty deaths from malaria each year, at the end of the second year of this study there were no deaths from this disease.



THE MOSQUITO THAT CARRIES YELLOW FEVER

Mosquitoes and Yellow Fever. — Formerly yellow fever was a terrible scourge in the southern cities of the United States and in the tropics. The common house mosquito carries this disease from the sick to all those

whom it is able to bite. This mosquito breeds in water-tanks, old bottles, tin cans, or any small pool of stagnant water near the house. The chief preventive measures are to screen the water-tanks and houses, and to avoid even the smallest amount of stagnant water. The mosquitoes already in a room may be killed by closing the room tightly and fumigating it by burning sulphur or pyrethrum powder. Mosquitoes resting on the ceiling may be killed by using a shallow tin cup or cover. This is fastened to the end of a long stick, and is partly filled with kerosene oil. To kill a mosquito, the cup is held close under it. When the mosquito starts to fly, it is caught in the kerosene.

Results in Havana. — When the United States Government took over the control of Cuba, one of the first things it did was to make Havana a safe place to live in. The suppression of yellow fever in that city will always remain one of the greatest examples of stamping out disease. An efficient Sanitary Commission set to work to clean the city, to enforce new health regulations, and to establish mosquito brigades. Keeping stagnant water in yards was prohibited and punished with fines. As a result of such rigorous measures, Havana to-day is free from yellow fever. Formerly two persons died of yellow fever every day, while now there are scarcely two cases during the entire year.

Simple Remedies against Mosquitoes. — Even when one is not exposed to danger, mosquitoes are very troublesome. Their bites poison some persons so that the spots become swollen and painful. Some simple

remedies are very successful in driving away mosquitoes. Screening doors and windows is the first precaution. When out-of-doors, burning any substance that produces a smoke will drive them away. In the house, pyrethrum powder may be blown into the air, or made into little balls and then burned. Several mixtures are useful to rub on the face, hands, or about the pillow at night. Oil of pennyroyal, citronella, or peppermint are helpful. The mixture that Dr. L. O. Howard, the well-known scientist, recommends is composed of one ounce of citronella, one ounce of spirits of camphor, and half an ounce of oil of cedar. To stop the pain of the bite, moist soap, ammonia, or glycerine may be rubbed on the spot.

The House-Fly. — Common house-flies are also carriers of disease. They may spread typhoid fever, tuberculosis, and other diseases. They do this by carrying the germs from filth to food which is eaten by the person who becomes ill. The legs and body of a fly may carry thousands of germs at one time. The house-fly is known as "The fly that does not wipe his feet."

Habits of Flies. — With the warm weather in spring, a few flies crawl out of the cracks of houses where they have been hiding all winter. A fly lays thousands of eggs in decaying matter like horse-droppings or garbage. In about five days white grubs appear, which develop brown, shining covers. After five days more a fly comes out of each brown case. There are many generations of flies in one season, which accounts for the swarms of flies. The largest numbers are seen from the middle of July to the middle of August.

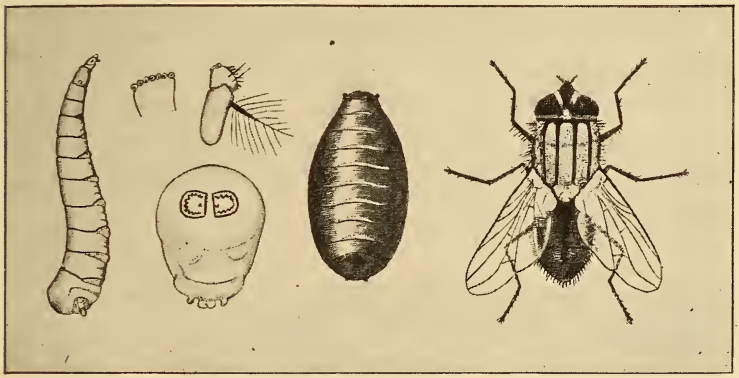
How to Exterminate Flies. — It is easier to prevent flies than it is to catch them after they have grown. Dirt, filth, decaying matter, and garbage should be removed from all houses, yards, streets, and vacant lots. The receptacle for garbage should be kept clean and covered at all times. Keeping every thing clean about a house is the best prevention. Flies may be kept out of houses by screening doors and windows. They may be caught with traps or sticky paper. All food should be kept away from flies and covered when not on the table. Food exposed for sale should also be screened and kept from flies and dust. If there is a nuisance in the neighborhood, notice should be sent to the Health Department which will have it removed.

Flies and the Sick. — Flies should always be kept away from the sick, especially from those ill with contagious diseases. If they are allowed to stray into the sick room, their bodies and feet may become covered with germs. Kill every fly in the sick room.

Typhoid Fever and the Cuban War. — During the Cuban War of 1898 typhoid fever killed more men in the army of the United States than bullets did. Within six weeks it developed in ninety per cent of the camps. Among the officers and men there were 20,738 cases with 1580 deaths. This means that one fourth of the soldiers had typhoid. Nearly nine tenths of all the deaths were caused by this disease.

How the Fever Spread. — It has been clearly shown that flies were one of the chief means of spreading the germs or contagion. Flies were everywhere present,

and went freely from the contagious material to the food while it was being prepared and served. After a while dust, bedding, clothing, and tents became infected and also helped to spread the disease. It is hard to believe that a government that has done such brilliant



Life History of the House-Fly

work in preventing disease should permit such a terrible loss of life.

How to Prevent Typhoid Fever. — This disease has always been a menace to health whenever large bodies of men have lived in camps. There are now two chief ways to prevent it. All sanitary measures in regard to water, drains, food, bathing, and camp life must be enforced. This is of prime importance, especially in a permanent camp. In addition, experiments have shown that vaccination against typhoid fever will protect the person from taking the disease or will lessen its severity. During the encampment of the troops at San Antonio, Texas, in 1911, many of the officers and men were

vaccinated against typhoid fever. As a result there was very little of that disease in camp. Vaccination may prove as protective against typhoid fever as it has against small-pox.

The Campaign against Flies. — While flies have always been considered an annoyance, they are now regarded as a danger. Filth, flies, and persons are a deadly combination. The Merchants' Association of New York is conducting an active warfare against flies. It has shown that most of the typhoid fever of that city occurs in houses within a few blocks of the water-front, where filth abounds. The Association has issued pamphlets on the extermination of flies. Civic Associations, Life Insurance Companies, and Women's Clubs have circulated other pamphlets on the house-fly. In Florida, Georgia, Louisiana, and Kentucky, the anti-fly poster is sent out by the health authorities. New Jersey, Missouri, and other states require the screening of bakeries, restaurants, and groceries. In New York the stables must be screened.

Rules of the Chicago Department of Health. — Screen all food and keep flies away from it.

Keep the streets clean.

Keep stable-manure — breeding place for flies — in a vault or pit or screened enclosure and sprinkle its surface with chloride of lime.

Quickly cover up food after a meal and bury or burn table refuse.

Keep damp cloths near meat dishes, milk jugs, and other food receptacles.

Burn pyrethrum powder in the house. It will kill most of the flies and those it does not kill will fall stunned, when they may be swept up and burned.

Sticky fly-papers are a second-rate palliative.

Remember that the exposure of any kind of refuse near a dwelling furnishes a breeding place for flies, and if food is exposed the flies will deposit germs upon it.

An Epidemic. — When many people become ill with the same contagious disease within a few days or weeks, it is called an epidemic. Many contagious diseases occur in this way from time to time. One person becomes ill and often unconsciously gives the disease to many others.

Some Epidemics. — Epidemics of typhoid fever, diphtheria, and scarlet fever are sometimes widespread. They result in much sickness, many deaths, and sometimes interfere seriously with business. There are on record 878 epidemics of typhoid fever alone in recent years, and this does not include them all. One epidemic occurred in Palo Alto, California, during which 232 persons had typhoid. All but two persons used milk from the same source, which had been diluted with water polluted with typhoid germs. In Boston, during January, 1907, 227 cases of scarlet fever broke out in four days. In 1907, 72 cases of diphtheria appeared within seven days in Hyde Park, Dorchester, and Milton, Massachusetts. Sixty-nine of these persons had taken milk from two milkmen who bought their milk from a farmer whose grandchild was ill with diphtheria. Without proper care one person may cause a large

amount of sickness and trouble. As soon as an epidemic of any disease occurs, it is the special duty of the Board of Health to search out the cause, and to prevent further spreading of the disease.



Foot of a House-Fly (Magnified)

Summary. — 1. Much has been done in the prevention of malaria, yellow fever, typhoid fever, and small-pox.

2. The marsh mosquito is the chief agent in the spread of malaria.

3. Malaria may be prevented by killing the marsh mosquitoes near dwellings, by avoiding their bites, by screening people suffering from malaria, and by taking quinine.

4. The house-fly is an important factor in the spread of typhoid fever. It has been called the "typhoid fly."

5. Many associations and health authorities are publishing pamphlets on the dangers of the fly.

6. Epidemics of typhoid fever, diphtheria, and scarlet fever may cause many deaths.

Questions. — 1. What insects are known to carry disease?

2. Are there any breeding places for mosquitoes near your home? Where would you look for them?

3. How may mosquitoes be exterminated near dwellings?

4. Did you ever see the early stages of house-flies?

5. How may flies be prevented? How may they be killed?

6. Can you find out about an epidemic near your home, and what was done to stop it?

XXI. THE SAFE CITY

"You are responsible for the safety of others as well as yourself."

Safety in a City. — When thousands of persons live together in a city, measures for their safety must be enforced. The public must be reasonably safe when in their homes, when at work, when in public places, and when going about. The health of the public must be protected at all times. Proper conditions for health when at work must be enforced. The public also expects protection from fire, from accidents, from burglars, and from violence.

The Public Health Service. — There are many health officers and boards of health in the United States whose chief duty is to guard the health of the public. At the head of them all stands the Public Health and Marine Hospital Service, with Headquarters at Washington, D. C. The work of the service is under the direction of the Surgeon General of the United States and is divided into several departments. One branch guards the ports of the United States against contagious diseases through the quarantine and immigration stations. Persons suffering from cholera, yellow fever, small-pox, typhus fever, plague, and any loathsome disease that will interfere with earning a living are refused entrance to this country. A large immigration hospital is maintained at Ellis Island, New York, where about 8000 patients are treated during the year.

One of the most important tasks done by the service is the investigation of certain diseases which may spread from state to state. Valuable work has been done on yellow fever in New Orleans and the plague in California. The Government maintains at Washington a Hygienic Laboratory where much of this study is carried on. Another important work is informing the public on health matters by means of printed pamphlets. It publishes five kinds of reports and bulletins, distributing over 365,000 copies a year. The Government operates also twenty-two hospitals on the sea, lake, and river shore. In these about 50,000 patients from the merchant marine are treated annually.

State Boards of Health. — Connected with the national Health Service are the State Boards of Health. The Surgeon General at Washington meets yearly in a conference representatives from the State Boards of Health of all the states. A state board of health exists in nearly every state in the Union. Its chief duty is to advise local boards in all sanitary matters, such as epidemics, water and milk supplies, and pure food. It also solves some problems which concern the health of the entire state and which cannot be left to the control of individual cities. It makes inquiries into the causes and prevention of contagious disease and especially of epidemics. A laboratory may be maintained for the examination and testing of food and water. It sometimes appoints members of local boards. County and township boards are also found in rural districts where the population is scattered.

City Boards of Health. — The members of the city boards of health are either elected by the voters or appointed by the mayor, the council, the county board, or the supreme court. Usually there is at least one physician on the board. The powers of the board are great and vary in different cities. Its chief duty is to enforce the sanitary laws. To this end it makes and enforces its own rules, which pertain to all health matters. The city board of health has many duties and a large force of helpers and inspectors. The health authorities have charge of the means used to prevent and control contagious diseases. The isolation of the sick, disinfection, ambulance and hospital service, and the production and distribution of antitoxin all come within its duties. Its officers inspect bakeries, tenement houses, laundries, and factories. Another important phase of its work is the abatement of nuisances, such as piles of ashes, old paper, rubbish, and garbage. The inspection of food, and the seizure of unwholesome or adulterated food is also carried on. The board keeps accurate accounts of the births and deaths within its city or town. It publishes and distributes pamphlets of instruction on popular health subjects. In some states these duties belong to the state board, and in other states to the city board.

Protection in a City. — The safety of the public rests in some cities with the Department of Public Safety, which is one department of the city government. In other cities this duty rests with several departments, such as the Police, the Fire, the Building, and the Street

Departments. In some of the larger cities there may also be a Committee of Public Safety, entirely separate from the government. Such a body of public-spirited men might well insist that the laws relating to the public safety be enforced, and could suggest and carry out new measures for safety.

The Police Force. — In every city it is the chief duty of the police to maintain the peace and to protect the public. The police force often forms a small army, according to the size of the city. At the head of this large body of men is the Commissioner, with the Chief as the first executive officer. A city is divided into police districts in each of which there is a station-house.

What the Patrolmen do. — The police that are best known to the public are the patrolmen who are seen on the city streets. Each officer has his own route or beat which he must patrol continuously. He must preserve order on the streets. His duties are many, but usually not very hard ones. He must know the business places on his post and the places where burglaries, crime, and fire are most likely to occur. He must report any public danger, such as a hole in the sidewalk or a fallen limb of a tree in the street. All of the streets must be kept safe for traffic. He must also report the details of any accident that may occur on his beat, and he must assist as far as possible any persons injured.

Arrests. — The most important duty of a police officer is to arrest persons for theft, drunkenness, assault, picking pockets, and other misdemeanors. Sometimes much judgment is needed to prevent arresting innocent

persons and subjecting them to inconvenience, annoyance, and loss of time and money. If help is needed in making arrests, a patrol wagon with a squad of policemen is sent from the station. Arresting is often a very dangerous duty, and many policemen have been injured or killed in taking desperate persons.



THE POLICEMAN

Special Duties. — Policemen are assigned or detailed to many special duties. Reserves are held at each station-house, and a squad of police may be sent out on call at any time to assist a patrolman. A squad may also be sent to a fire. The police are often detailed to help the different departments of the city government, such as the Health Department. Nearly all large public meetings are policed by one or more men. Exhibits, shows, and public gatherings often need the services of the police.

The Police Signal System. — At many of the public squares and street crossings throughout a city are located the iron boxes of the police signal system. By means of these each policeman communicates with a station-house at regular periods, usually once an hour. In this way he may call for a patrol wagon, an ambulance, or for assistance. This system also tends to hold the patrolmen up to their duties.

The Detectives. — The detective force is a most valuable division of the police. If a murder has been committed, the detectives are set to work to discover the offender. If houses are broken into or set on fire, the detectives find the guilty persons. Often these officials do their work in plain clothes, so that it is hard to identify them. They work at night as well as during the day and are the special agents for searching after criminals.

The Traffic Police. — The mounted police that patrol the business parts of a city belong to the traffic squad. They keep the crossings clear, keep the wagons on the right side of the street, keep the teams moving in the right direction, and in general enforce the traffic laws. An officer must be mounted on horse, bicycle, or motorcycle to overtake and arrest persons trying to escape from the penalty of broken laws in wagons or automobiles. Many an officer can tell of an exciting chase.

Danger from Fires. — Since bells have ceased ringing for fires in cities, we are likely to forget the danger from fire. In New York City in one year there are as many as 20,000 alarms of fire. The smaller cities may have

300 or more alarms. These fires cause danger to life. When the Iroquois Theatre burned in Chicago 590 lives were lost. More than one factory has burned with a loss of 50 or 100 lives. In the great fire in San Francisco, in 1906, 260,000 persons were made homeless.

Loss from Fires. — It would be hard to estimate the entire loss from fire in the United States during one year. A few of the largest fires will show how great this loss is. In the San Francisco fire of 1906, 28,000 buildings were burned at a loss of $400,000,000. In the great Chicago fire of 1871, there were 17,500 buildings burned at a loss of $200,000,000.

Causes of Fires. — Fires start in many different ways. Some are due to accidents or carelessness in handling fire, matches, and lamps. Defective chimneys and overheated stoves and furnaces are responsible for many fires during the cold weather. Many fires are set by mischievous boys or malicious men. Any one who wilfully sets fire to the property of another should be found by the police and punished by the courts. Defects in gas-pipes and electric wiring are responsible for many large fires. Explosives have also caused numerous fires.

The Extinction of Fires. — A large fire is a fearful and a wonderful sight. Fighting fires in large cities is done by men with special training. The fire department is one of the most important branches of the city government, and is under the charge of a fire commissioner.

The Force of Men. — The Fire Chief is the head executive officer of the force, and commands at all of the large fires. In a large city he may have charge of as

many as five thousand men. This force is divided into companies composed of captains, engineers, drivers, hosemen, and laddermen. In the smaller cities there are also call-men who attend to various other occupations, but who respond to fire alarms.

Fire Apparatus. — Each company of men lives at one of the many stations which are located in all the parts of a city. There may be as many as two hundred stations, and in New York no building is situated more than a mile and a half from some station. The fire apparatus includes fire engines, chemical engines, hose wagons, hook and ladder trucks, aerial ladders, and water towers. The horses are a very valuable part of the equipment. They are selected with judgment, trained for their duties, and receive the best of care. In some cities automobiles and power-engines are doing the work of horses.

Fire Boats. — Most of the cities that have valuable property situated along the water-front of a river, lake, or ocean, have added fire boats to their equipment. A fire boat resembles a tug, but is finished in as stout and as fireproof manner as possible. It is furnished with powerful pumps, pipes, and nozzles, some of which can throw a stream of water five and one half inches in diameter. Water towers, chemical fire extinguishers, and fire-fighting tools, like axes, buckets, and ladders, complete the equipment. The river, lake, or ocean water is used for fighting fires. Fire boats are an invaluable aid in fighting fires in vessels and on wharfs. They may even assist at fires on land within a mile of

the water-front, when drawn up beside the nearest wharf, by laying a line of hose from the boat to the fire.

The Fire Alarm System. — Formerly in cities, and to-day in many towns, the call for help is sounded loud and long by ringing the nearest church-bell. In cities to-day a call may be sent by telephone to fire head-



Modern Fire Engine

quarters, or the alarm may be sent from an alarm box. The fire alarm system is a telephone system connecting the headquarters with all the alarm boxes and with all the engine houses. In many cities there are no fire-bells to announce a fire and to give the number of the box, this being done entirely by electric signals.

The Fire Insurance Patrol. — Often the damage from the water used at a fire may cause as much or even more loss than the fire itself. If a fire has started on the fifth or sixth story of a business block, the water that

floods the lower stories may do an immense amount of damage. To prevent this the large insurance companies support fire patrol companies. A squad of ten or more men respond to alarms in the crowded districts of cities. They are dressed like regular firemen, but wear white rubber coats instead of black. It is their special duty to rush in and cover the furnishings and contents with rubber blankets before the regular firemen turn on the water. They are supplied with hooks, ladders, and other tools for breaking into burning buildings. They are stationed at places similar to fire apparatus-houses.

The Water Service. — Little can be done at a fire without a good supply of water. The water is usually taken from the city water-supply. Hydrants are placed at intervals on the sidewalks, and these connect with the water-mains in the streets. The fire engine connects with a hydrant, and by means of a line of hose forces the water to any desired place. Many large cities have a separate high-pressure service for fighting fires. This water is usually taken from a river, lake, or the ocean. Powerful pumps at a main station force the water through a separate network of pipes in the business section of a city. A hose attached directly to a high-pressure hydrant will throw a stream of water into the upper stories of the highest buildings. No fire engines are needed with this water service.

Giving the Alarm. — After a fire breaks out, only a short time should be spent in trying to extinguish it with pails of water or hand extinguishers. As soon as possible

some one should ring in an alarm from the nearest box. Opening the door of the box does not give an alarm. Pulling down the hook once and releasing it starts the message over the wires to headquarters. Here the operator receives the number of the box sending in the alarm. He immediately gives the signal to all the companies that respond to fire alarms from that box.

Answering the Alarm. — The small gong that rings the alarm in the engine house also stops a clock, that tells at what instant the alarm is received. By a mechanical device it also releases the horses, which rush out of their stalls to their places under the hanging harness. The watchman snaps the harness together, while the men are sliding down the poles or climbing on the apparatus. In a few seconds from the time of the alarm horses and men dash out of the station to the fire.

Fighting a Fire. — At a large fire in the crowded part of a city three or four engines, hose wagons, hook and ladder truck, aerial ladder, and water tower are all on the scene within a few minutes. A squad of fire patrol are already protecting perishable goods with rubber covers. An ambulance with a corps of surgeons is present in case of emergency. A squad of police have responded in a patrol wagon to assist in handling the crowd that always gathers. Finding the fire and drowning it out with water is often a very dangerous task. Firemen face many dangers from smoke, explosions, falling walls, and roofs. Rushing into burning buildings and rescuing frightened persons is a common

event. It takes courage, training, and skill to make a good fireman.

Fire Escapes. — Much can be done to prevent loss of life in case of fire by supplying proper fire escapes on factories, schools, and office buildings, and on all other high buildings. A reliable fire escape consists of iron balconies with railings on each story and iron staircases leading from the balcony of one story to that of another. Many fire escapes have proved fire-traps because they did not lead to the roof and to the ground. The lower ladder should be so attached from the lowest balcony as to be ready for use at a moment's notice. Staircases also should lead to the roof to afford another means of escape upon the roofs of adjoining buildings. Laws provide that the fire escapes shall be kept free at all times from flower pots, chairs, boxes, and all other objects. It is especially difficult to enforce this law among the crowded tenement houses in large cities, where there is the greatest danger in case of fire.

Valuable Safeguards. — The first five minutes after a fire starts is the most valuable time for fighting it. Many a large fire could have been prevented if water had been at hand when the fire was first discovered. Fire-buckets filled with water are a ready means of putting out a fire when it first starts. It is necessary to keep the buckets filled with water and to use them for no other purpose. Hand extinguishers are valuable in schools, hotels, and other large buildings. An extinguisher consists of a metal holder containing chemicals and water. Inverting the extinguisher mixes the con-

tents and charges the water with a gas that will put out fire. Chemicals are especially useful at the beginning of a fire since it may then be possible to extinguish the fire without doing great damage from water.

Other Precautions. — Many fires could be extinguished with little loss if a hose were available ready for use when the fire was first discovered. Many large buildings have been equipped with reels of hose that are always connected with large water-pipes within the building. Automatic sprinklers are probably the most effective device in buildings for fighting fires. These are connected with a separate system of water-pipes extending throughout the building. These pipes are usually located near the ceilings. At short intervals along the pipes the sprinklers are located. Usually the openings are sealed with a metal that melts easily, but when a fire occurs the heat from the fire melts the seals, and the water pours down on the fire. Such a system placed on the outside of a building forms a curtain of water all around the building. This is a great protection from fires in neighboring buildings.

Fire Drills. — Another precaution against the loss of life in fires is the fire drill. In all large buildings where many persons assemble every day fire drills should be compulsory. Every one should know just what to do in case of fire. In large factories some of the workers should be trained to use the hose and extinguishers until the regular firemen arrive. In many schools the pupils are taught to file out orderly and quickly, so that a building may be cleared of more than a thousand pupils

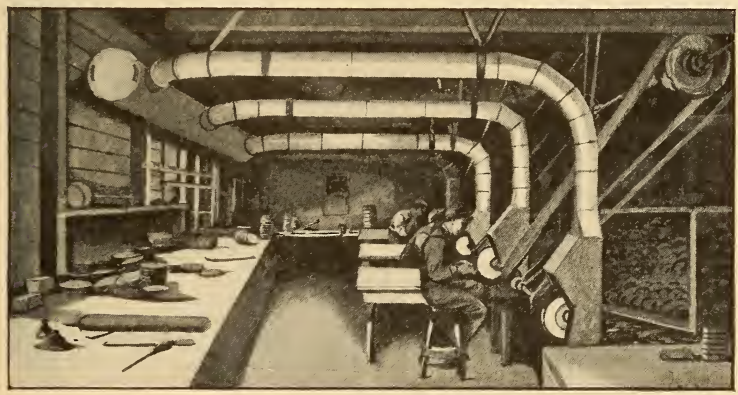
within two or three minutes after the sounding of the fire gong. All of the occupants of a large building should be trained so that they will know how to leave the building in the least possible time.

Fire Prevention. — An organized effort is now being made to prevent fires. In New York City a company has been formed on a business basis to prevent fires. It has men ready to send into factories, stores, offices, or any building to take charge of all measures relating to the prevention of fires. In a store such a man would organize and drill a fire company from among the workers. He would also recommend and locate the extinguishers and hose. He would see that the water-supply was sufficient and that the fire escapes were kept ready for use at a moment's notice. Men are ready to go to towns and villages to establish and drill local companies. In this way the work of preventing fires will extend all over the United States.

Dangerous Occupations. — There are a few occupations that will always remain dangerous. Seamen, soldiers, firemen, and divers must always be ready to face danger. Exposures to extreme heat, cold, smoke, water, and disease demand courage and pluck. The heroes of every-day life are not always as well-known as those of war.

Unhealthful Occupations. — There are many occupations that are likely to cause certain diseases among the workers. Sometimes the danger comes from the general surroundings and sometimes from the nature of the occupation. Healthful conditions in stores,

factories, and workrooms depend upon good light, both natural and artificial, sufficient ventilation, the proper regulation of heat and moisture, and upon safe sanitary arrangements. Neglect in furnishing proper surroundings may be due to ignorance, carelessness, or greed.



GRINDING ON EMERY WHEELS
Effective exhaust system for the removal of dust

Hygienic Surroundings. — In some factories the utmost care is used to secure the most hygienic surroundings possible. Lunch rooms and recreation rooms are furnished, and the outside surroundings are made attractive with lawn and shrubbery.

Danger from Dust. — The fine particles of dust produced in manufactories cause a large amount of sickness. These small particles are inhaled by the workers, and weaken their lungs, so that consumption, asthma, and other lung diseases appear. The workers that are most subject to these diseases are tin miners, earthenware

manufacturers, file makers, cutlers, quarrymen, cotton and wool operatives, and masons.

Prevention. — There are several devices that may be used to prevent the workers from inhaling dust. The most valuable remedy is an exhaust system of ventilation in the factory, which sucks the dust away from the workers. Over the workbench of each person is a metal hood or guard connected by tubes to the rest of the system. The illustration on page 289 shows clearly the hoods placed over emery wheels where workers are grinding. It also shows how clear the air is from dust. Another device to prevent breathing the dust is called a respirator. This is worn over the mouth and nose, and is held in place by one or two straps passing around the head. It may be made of a wire frame and a piece of sponge or cloth to strain the air breathed, and to keep the dust from passing through.

Other Safeguards. — In some trades in which the eyes are especially exposed workers wear large spectacles. A few trades are so dusty that helmets are worn, into which pure air is forced. In some trades the danger from dust that is composed of poisonous particles is very great. Workers in the manufacture of plumber's supplies, lead paint, the handling of type in printing offices, and the glazing of pottery are especially liable to lead poisoning. In dusty trades especial care should be taken to insure the best ventilation that is possible under the conditions.

Danger from Poisonous Gases. — There are some trades in which poisonous or irritating gases are given

off. In the manufacture of rubber cloth, patent leather, and other articles, the poisonous fumes of naphtha escape. These are particularly dangerous and difficult to guard against.

Danger from Poisoning. — Among the workers who handle lead and the other poisonous metals there is frequent poisoning. The men exposed to this danger are painters, plumbers, pottery-workers, dyers, weavers, and many others.

How to Prevent Poisoning. — Keeping the body in perfect health is of the utmost importance. Nutritious food, fresh air, and cleanliness are very necessary. When not at work care should be taken to remove all poisonous particles Especially before eating, the hands should be thoroughly washed. Factories need to be thoroughly ventilated to remove all of the particles in the air.

Safe Surroundings. — We expect in a city reasonable protection from fires, accidents, dust, and unsanitary surroundings. We are usually safe whether at home, at school, at work, in public places, or on the streets. Our health is protected by laws which we, as good citizens, should help to enforce.

The Healthful Home. — The individual homes make up the life of a city. A home to be healthful must be well-located, ventilated, warmed, lighted, finished, furnished, and kept clean and orderly. Moreover, when we live among other persons we should respect our neighbors and their rights. We must join with them to maintain an orderly and quiet neighborhood. We must

unite with all of the other citizens in making our city law-abiding, clean, healthful, and beautiful. We think of the house which we occupy as our immediate home. In a larger sense the city which we know and in which we live may be our larger home.

Summary. — 1. Boards of Health are the guardians of the public health.

2. The safety of a city depends upon the police, the fire, the building, and the street departments.

3. The efficiency of the fire department depends largely upon the fire alarm system, which connects with all of the alarm boxes and apparatus-houses.

4. The high-pressure water service is of the greatest assistance in fighting fires in tall buildings.

5. Many hundred lives have been lost through faulty fire escapes.

Questions. — 1. What duties have you seen patrolmen do?

2. How may policemen send messages to the station-house?

3. How do fires start?

4. What apparatus have you seen at fires?

5. What are some of the dangerous occupations?

6. Why are the dusty trades a menace to health?

7. What are the safeguards commonly used to protect against dust?

XXII. A NATIONAL EVIL

"Our national expenditure on alcoholic drinks means more than wasted money. It implies an enormous mass of wasted health and of lost lives."

Dr. Arthur Newsholme.

Importance of the Drink Question. — The subject of intoxicants touches every one of us directly or indirectly. Liquors have been the subject of laws and taxes, and have played an important part in politics. In 1911 the amount of intoxicating liquors sold in the United States was over 2,385,000,000 gallons, the amount having doubled in sixteen years. This means an allowance of twenty-five gallons for every man, woman, and child. As a large percentage abstain entirely, the drinkers must be responsible for more than this allowance.

The Magnitude of the Liquor Traffic. — The manufacture and sale of intoxicants were among the great industries of this country. The total capital invested in the liquor interests in the United States was more than $2,000,000,000. In 1911 the total government revenue from alcoholic liquors was $219,597,685. There were 256,521 proprietors of establishments dealing in liquors, and their employees numbered many more. It was estimated that at least 2,000,000 individuals were supported by the liquor traffic, including the production of materials and the transportation of the products.

A Cause of Insanity. — Alcohol works the greatest

damage to the brain. It may weaken the will or the moral powers. With extreme use, a person may become feeble-minded or insane. It is estimated that from twenty-five to thirty per cent of all the insane patients in asylums in the United States owe their misfortune to the use of liquor. The support of these unfortunates is a great expense to the Nation. Nearly every large city and every state maintains an asylum for them.

A Cause of Crime. — Since the abuse of alcohol impairs the moral sense, the judgment, and the will, it naturally incites men to break laws and to commit crimes. A study of the criminals confined in our jails, prisons, and workhouses has shown how many were reduced to their unfortunate condition through the use of intoxicants. The investigation of the Massachusetts Bureau of Labor Statistics showed that eighty-four per cent of all criminals confined in the correctional institutions of that state owed their downfall to intemperate habits. Excluding drunkenness and disorderly conduct, alcohol was still responsible for fifty per cent of all the crimes. The Committee of Fifty, a body of able scientific men who investigated the liquor problem, studied the records of over thirteen thousand convicts scattered throughout twelve states. They found that alcohol was responsible for about half of them. To intoxicants must be charged a large part of the support of police systems, criminal courts, jails, prisons, and reformatories.

Poverty and Alcohol. — The daily expense of ten, twenty-five, or fifty cents drains a man's pocket as well

as his health. The results of scientific study show that fifty per cent of the paupers in almshouses had been brought to their condition by the use of liquor either by themselves or by their parents. Thousands of dollars are annually given by the numberless charity societies for the relief of the poor. In addition, cities and states support almshouses and reformatories.

Destitute Children. — Some of the most pitiful results of intemperate habits are seen in the condition of the children who are either neglected or deserted by their parents. It is estimated that in this country about sixteen thousand children are annually deserted. There is a still larger number who need the friendly services of societies for the prevention of cruelty to children. The Committee of Fifty discovered that nearly forty-five per cent of these children owed their destitution to the intemperance of parents or guardians.

Temperance Reforms. — Alcohol has not worked havoc in this country without great opposition. Temperance agitation has been one of the most remarkable movements in society for over a century, and has called forth many unselfish and enthusiastic workers. Papers have been published devoted to the cause, and other literature has been distributed all over the country. From time to time noted lecturers have appeared, filled with zeal and fervor. John B. Gough, a reformed drinker, was long the most brilliant and famous speaker on the temperance platform. He was a powerful orator, and could move an audience to laughter or tears. The preachers of every sect and denomination have always

taught and usually practised temperance. Meetings, lectures, and conferences have been held to further the cause. Moral suasion has long been regarded as the powerful ally to temperance.

Temperance Societies. — In every state, temperance societies have worked for the cause. As long ago as 1850, a great temperance wave swept over this country, and Washington Temperance Societies were established. In every state, thousands signed the pledge. Some of our greatest men, like Abraham Lincoln, have added their influence to the temperance cause. The influence of Lincoln's mother, who died when he was but nine, was never effaced. Three things she had impressed upon him: never to tell a falsehood; never to use profanity; and never to taste liquor. Later, a great Temperance Legion, including hundreds of thousands of persons who had signed the pledge, bore his name.

Prohibition. — Formerly, moral suasion was the chief weapon; now the law has been called upon to aid the cause. Gradually, state after state has voted against the liquor traffic. Before the United States had joined the World War in 1917, sixty per cent of the people of the United States were living under prohibition. This included over eighty-seven per cent of the total area of this country. By January, 1920, the inhabitants of thirty-three states, the District of Columbia, Alaska and parts of the other fifteen states were enjoying prohibition laws. Maine and Kansas were the two pioneer prohibition states.

General Wood and Prohibition. — General Leonard A. Wood, formerly in charge of Camp Funstan, Kansas, made the following statement regarding Kansas boys who enlisted in the army:

"I find that Kansas boys and men grade far higher in morals, obedience, and stamina than the men of other camps. The discipline is the best I have ever seen. We attribute this to prohibition in Kansas. These boys were brought up in a clean atmosphere — they started right. Tell the Kansas people for me that they have the finest, the cleanest, the healthiest, and the most vigorous soldiers in point of endurance we have ever seen. The official records show this."

National Prohibition. — When the United States joined the World War, all of the available man-power and money was needed to win the cause. So the war-time prohibition was passed and went into effect July 1, 1919. In this way, the fifteen states in which liquor had been sold became prohibition states. As a war measure, the entire nation lived under prohibition for six months. National prohibition became more permanently established through the passage of the 18th Amendment to the Constitution of the United States. This went into effect on January 17, 1920.

Prohibition and Children. — Although it is very difficult to enforce prohibition everywhere, many children are feeling the good results of it. Part of the money that was formerly spent on alcoholic drinks now helps to support the home and family. The children now have happier homes, better care, and less cruel treat-

ment. They also have better and more clothing. Higher priced groceries and more abundant food are provided. Money is spent more liberally for health, recreation, and vacations. A larger amount of money than formerly is put away in the savings banks for future use. The family has fewer bills and debts.

Prohibition and the School. — Prohibition helps children to obtain an education. The attendance at school is more regular and scholarship is higher. There is a brighter and more helpful spirit among the children, their parents, and the neighborhood. The children are healthier, cleaner, more respectful, and more earnest. The boys and girls, who formerly were obliged to go to work, are now able to remain longer in school. Continuation and high schools have become more popular.

Other Results of Prohibition. — The greatest benefits have been to the drinkers themselves. Men have been changed from habitual drinkers to sober, working, law-abiding men. Homes have been made happy and even reëstablished. Arrests for drinking in Massachusetts, alone, have been reduced about seventy-five per cent. Arrests of all kinds have been reduced one-half. This has relieved the courts of a large amount of work and expense. A decrease of sixty-five per cent of the work of the county jails and homes of correction has resulted. In seven large cities, the average of total deaths from alcoholism per month fell from fifty to seven. The great saving in human suffering, number of deaths, and amount of money can hardly be estimated.

Summary. — 1. Intemperance is one of the great social problems of the day.

2. In the liquor traffic, about two million persons were interested and two billion dollars were invested.

3. Alcohol formerly caused about thirty per cent of the insanity found in asylums.

4. About eighty-four per cent of all criminals owed their downfall to intoxicants.

5. The liquor problem affects thousands of children who are neglected by their parents.

6. National prohibition became operative on January 17, 1920, through the 18th Amendment to the United States Constitution.

Questions. — 1. Why is intemperance a national evil?

2. What are some of the societies that help deserted children?

3. How have children profited by prohibition?

4. What has taken the place of the saloons?

5. Are men still able to obtain alcoholic liquors?

6. Why is prohibition hard to enforce?

XXIII. THE HEALTH CAMPAIGN

"The greatest asset of any nation is the good health of its citizens. "Every one who would like to see the United States continue its progress can do a patriotic service by keeping well. It is the very cornerstone of happiness, prosperity, and contentment."

Carter Glass.

The Health Campaign. — One of the most striking lessons taught by the World War was the value of good health. It was made clear to thousands in this country, that to be useful they must be healthful and physically fit. The correction of physical defects among soldiers, the medical inspection of school children, and the clinics for babies have all been a part of a great campaign for better health. As Rupert Blue, formerly Surgeon General of the United States Public Health Service, has said, "Every one of us has a part in the public health. To ourselves and our families we owe the duty of keeping in the best possible physical condition; to our community and Nation we owe the duty of helpful coöperation to improve and conserve the health of those about us."

Lessons of the World War. — When this country entered the World War, thousands of young men were examined physically and mentally for service in the army and navy. It was a great shock to this Nation to learn that nearly one third of the young men in the prime of life were suffering from defects, some caused

by ignorance and carelessness, many of which might be remedied. The records show that from thirty to fifty per cent of the men who registered under the draft were rejected on account of physical defects.

An Important Discovery. — This condition had developed during the time of peace. In about one quarter of the states, seventy to eighty per cent of the men examined were accepted. These states were Texas, New Mexico, Oklahoma, Arkansas, Nebraska, Wyoming, Iowa, South Dakota, North Dakota, and Minnesota. They are agricultural states. In another quarter of the states, sixty-five to sixty-nine per cent of the men passed the tests. These states were Louisiana, Florida, Mississippi, Alabama, North Carolina, Missouri, Illinois, Indiana, Ohio, West Virginia, Maryland, Wisconsin, and Montana. In another quarter of the states, only sixty to sixty-four per cent of the men were fit. These states were Utah, Nevada, Oregon, Idaho, Georgia, South Carolina, Tennessee, Virginia, Pennsylvania, and New Jersey. The remaining states sent from fifty to fifty-nine per cent of their registered men. These states had a manufacturing population, or in the West, included many invalids from all over the country. These states were Arizona, California, Colorado, Washington, Michigan, New York, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, and Delaware. Country boys made better records than city boys.

Condition of School Children. — This unfortunate condition of the young men caused anxiety about the

boys and girls still in school. The people naturally asked, "What is the condition of the school children? What can be done to prevent and remedy their physical defects?" Many large cities made health surveys of of the school children. From these, it was estimated that seventy-five per cent of the children were in need of attention on account of retarded development or physical defects.

Over 50 per cent had defective teeth.
Over 30 per cent had enlarged tonsils or adenoids.
Over 25 per cent were suffering from malnutrition.
Over 25 per cent had defective vision.
Over 5 per cent had impaired hearing.
About 5 per cent had spinal curvature, flat foot, or other deformity.
About 5 per cent had tuberculosis of the lungs.
About 2 per cent had heart disease.

Many cities began to remedy these startling conditions and are still working at the problem.

Child Welfare. — How can a child become happy, strong, and vigorous? We have come to see that the physical education of a child should consist of three different parts. First, a child needs every opportunity to grow normally. Athletics, swimming, rowing, winter sports, and gymnastics are all helpful. Gardening, playground games, camping, and scouting are beneficial. Many health clubs and organizations, as the Boy and Girl Scouts, offer a valuable opportunity for self development. Second, children need to be protected from communicable diseases and prevented, if possible, from developing physical defects. Any existing defects

should be early recognized and corrected. This may be done through the medical inspection of schools. Third, children need to be taught how to live healthfully and helped to form good habits of living. This can best be accomplished through the coöperation of

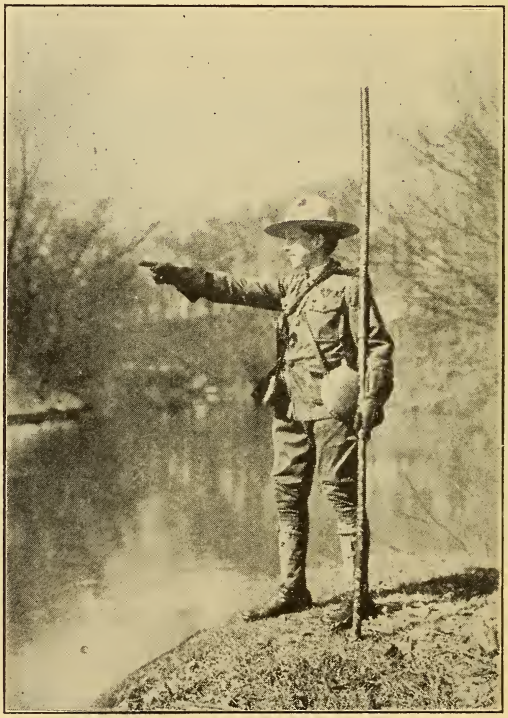


Tooth Brush Drill

the home, the school, and the boy himself. Special training in the nutrition class, the tooth brush drill, the open air class, and other exercises may be of great help.

The Boy Scouts. — What live American boy does not know all about the Boy Scouts? How does scouting help boys physically? It gives them many opportunities in camping, hiking, swimming, and sports to develop character, muscle, nerve, and endurance. A scout takes the oath, "To keep myself physically strong, mentally

awake and morally straight." One of the scout laws is, "A scout is clean. He keeps clean in body and thought, stands for clean speech, clean sport, clean habits,



Boy Scout

and travels with a clean crowd." Out of the fifty-eight different subjects for intensive study, swimming, personal hygiene and public health are the most popular. In 1917, over twenty-seven per cent of scouts qualified in these subjects as first class scouts. A scout learns the

laws of health and how to take care of himself. It gives a boy a chance to keep physically fit. Scouting makes boys into men.

The Girl Scouts. — Over 40,000 girls scattered all over the United States can testify to the value of the scout organization. Health knowledge is one of the four essentials to become a tenderfoot scout. There are scout merit badges to be won for first aid, athletics, child care, cookery, cycling, gardening, personal health, home nursing, swimming, and other subjects closely connected with health. Camping and hiking offer unusual opportunities to become strong and vigorous. Many girls have thus had their first experience in living in the open and enjoying birds, flowers, and the great out-of-doors.

ON THE TRAIL

Oh! this is the song we sing, as the gay Girl Scouts go marching,
Away on the trail we swing, with heaven over-arching,
As up, up, up the hill we climb, and down, down, down again,
Our hearts are happy all the time, and we step to the gay refrain,
Marching on! Marching on! Marching on through rain or sunshine!

From *Campward Ho.*

The Camp Fire Girls. — One of the laws of the camp fire is to "Hold on to health." *Wohelo* is the watchword, which is made up of the first two letters of *work*, *health*, and *love*.

Camp Fire Girls are of three ranks: wood gatherers, fire makers, and torch bearers. Weekly meetings help girls toward new activities and achievements. Honors are awarded for attainment in personal hygiene and

first aid. Elective honors may be attained in health-craft which includes first aid, regularity, proper diet, sleep, games, swimming, diving, paddling, rowing, skating, snowshoeing, tramping, and other sports. Summer camping is the great opportunity of the Camp Fire Girls.

The value of health is emphasized in part of the "Fire Lighting Ceremony." "We hold on to health, because through health we serve and are happy. In caring for the health of our persons we are caring for the very shrine of the Great Spirit."

The Medical Inspection of Schools. — The prevention of communicable diseases together with the discovery and correction of physical defects and other causes which prevent the normal development of children are the chief aims of the medical inspection of schools. This is so important, that over five hundred large cities in the United States have established this work in their schools. About thirty-four states have departments of child hygiene or welfare which also help. School physicians, nurses, dentists, and teachers coöperate with the parents for the better health of the children. Valuable results have already been obtained in reducing the number of absences for sickness and in correcting defects so that children are able to make their normal gain in weight and height.

The School Physician. — The responsibility for the health of the school rests chiefly on the school physician. He examines every child under his care at the beginning of the school year. Each child is weighed and measured,

and the results compared with a standard for his age. Under weight is one of the sure signs of malnutrition. The physician is on the lookout for all children who show signs of retarded growth, or have defects in sight, hearing, teeth, tonsils or have adenoids. Deformed spines and feet and troubles of the skin are also detected. The monthly inspection may reveal the early



Medical Inspection in School

stages of measles, scarlet fever, and other communicable diseases in children. These children are sent home and the Board of Health is notified. In the daily or semi-weekly inspections, the physician examines any children sent to him by the nurse or teachers. We must all coöperate with the school physician and the Board of Health to prevent epidemics.

Vaccination. — Vaccination against smallpox may be one of the duties of a school physician. Smallpox is a

very loathsome, dangerous, communicable disease which usually leaves a person "pock-marked" for life. Vaccination is a method of prevention against smallpox. That vaccination does prevent the spread of smallpox is a matter of history. In seven provinces of the Philippine Islands there were annually 6,000 deaths from smallpox alone. In 1916, measures were taken to stamp out this disease and 3,100,000 persons were vaccinated. The following year, instead of 6,000 deaths from smallpox, there was not one.

Vaccination not Dangerous. — After vaccination, a small pimple appears, remains for twelve to fourteen days, after which the redness and swelling gradually disappear. Vaccination should be carefully done by a physician with fresh material which has been prepared under special precautions by the Government. When properly cared for, vaccination is no more dangerous than any pin scratch on the skin. During 1918 and 1919, over 3,000,000 persons were vaccinated in this country without a single death. It is a law, although not very well enforced in some states, that every child must be vaccinated before attending school for the first time. On exposure to smallpox, you should be vaccinated at once unless you have been vaccinated within the last five years or have already had smallpox.

The School Nurse. — The school nurse is the lookout always on the watch for disease. At the regular, daily school inspections, she examines the eyelids, throat, teeth, skin, and hair of each pupil. After the visit of the physician, the nurse carries out his orders with

treatment or instruction to the children. In emergencies, as accidents, fainting, cuts and burns, the services of the nurse are very helpful. The nurse is the most important link between the school and the home. When a child has a serious defect, the parents should give the necessary care and correction. It is the nurse who explains the condition and advises the parents. With the consent of the parents, children may be taken, when necessary, to hospitals or dispensaries for treatment.

The School Clinic. — The school clinic is the physician's office. It is a room supplied with running water, a table, chairs, a pair of scales, and a few medical appliances and remedies. Generally clinics are painted white, fitted with white furniture, and kept scrupulously clean. In them, the school physicians make physical examinations; children may be weighed and measured; nutrition classes may meet; and individual health charts are kept on record.

Other Clinics. — There are also special clinics. The object of the dental clinic is to insure sound, clean teeth to all children. The use of the tooth brush is taught in a practical way by tooth brush drills. In the eye clinic, children with poor vision are fitted with glasses. Then they are better able to compete with children with normal sight. The cause of mouth-breathing and deafness is determined and, if possible, is remedied. This is sometimes due to the growth of adenoids or to diseased tonsils. In posture clinics, slight curvatures in the spine, round shoulders, and flat feet are detected. Children are trained in prescribed exercises which help or correct

their handicaps. In speech clinics, stammerers and stutterers are aided to overcome their impediments.

The Health Record. — A clean bill of health is an asset for every boy or girl. The health record should be added to the school report card to make a complete report of the progress of each pupil. Steady gain in weight and height, and the formation of good health habits are important to earn high marks in studies. The health record should show the results of physical examinations and attacks of child's diseases. It should also show how defects have been remedied or cured.

Malnutrition. — It is estimated that about one third of all children are underweight for their age. That is, they are behind their grade in growth or are malnourished. This applies to all children; the city child and the country child, the rich and the poor alike. What is the cause of this condition? Malnutrition may be due to physical defects, overfatigue, insufficient or improper food, unfortunate conditions at home and many other causes. Malnutrition may be easily remedied when the causes are known and the proper remedies are applied. The first step is to weigh all school children and to select those that are underweight for special treatment. The next step is to determine, if possible, by physical examination the cause of malnutrition in each child.

The Nutrition Class. — Each child must do his part in the effort to gain weight. Any child whose weight is more than seven per cent below the average for his height is considered malnourished. In the nutrition class,

conditions are made favorable, as far as possible, for each child to gain. Physical defects, when present, are corrected. Provision is sometimes made for food in the middle of the forenoon as well as a hot mid-day lunch. Often a rest period is arranged in the middle of the day. Instruction is given and insisted upon for sleeping with open windows at night and regularly eating proper food at home. Individual health records are kept and if improvement is not constant, the cause is investigated. When a child is in earnest and has the co-operation of the home, a remarkable gain in health may be accomplished in a few weeks.

The Average Weight. — The average weight for the age has been estimated by weighing many thousands of children. The standard heights and weights for children from 10–16 years are given in the table below.

TABLE OF WEIGHTS AND HEIGHTS OF CHILDREN

Ages	Boys		Girls	
	Height	Weight	Height	Weight
	Inches	Pounds	Inches	Pounds
10 yrs.	51.7	65.3	51.3	62.4
11 yrs.	53.3	70.2	53.4	68.8
12 yrs.	55.1	76.9	55.9	78.3
13 yrs.	57.2	84.8	58.2	88.7
14 yrs.	59.9	94.9	59.9	98.4
15 yrs.	62.3	107.1	61.1	106.1
16 yrs.	65.0	121.0	61.6	112.0

— *From Children's Bureau, United States Department of Labor.*

Health Habits. — After a child has reached his normal weight he should be ambitious to continue to grow. A relapse into former bad babits of eating, sleeping, resting, or injurious practices will result in arrested growth. The time to acquire proper habits of hygiene are during school life. If a child is well and is trained in good health habits before he is eighteen years of age, he has a good start in life. Are you living up to these requirements suggested by the United States Bureau of Education?

A full bath more than once a week.
Brushing the teeth at least once every day.
Sleeping long hours with windows open.
Drinking as much milk as possible, but no coffee or tea.
Eating some vegetables or fruit every day.
Drinking at least four glasses of water a day.
Playing part of every day out of doors.
A bowel movement every morning.

Summary. — 1. The World War revealed the fact that about one third of the young men were unfit for military service.

2. During the great war an investigation of health conditions in the United States schools resulted in the knowledge that about three quarters of the children were handicapped by physical defects.

3. The medical inspection of schools as well as child welfare departments and organizations is doing a much needed work in conserving child health.

4. Every child should be weighed and, if found below normal, should be helped to gain weight.

Questions. — 1. Do you belong to any health club? What are some of the advantages?

2. What is your city doing for the welfare of its boys and girls?

3. Why should your school send home a health report?

4. Are you up to the average in weight for your age? If not, why not?

5. Can you name five good health habits?

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Chapter I. The Healthful Home

Household Hygiene, *Elliott*
Home Sanitation, *Richards and Talbot*
Practical Domestic Hygiene, *Notter and Firth*
Personal and Domestic Hygiene, *Schofield*
Household Hygiene, *Bissell*
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In City Tents, *Herrick*
The House Dignified, *French*
The Tenement House Problem, *De Forest and Veiller*
The Battle with the Slums, *Riis*
Distinctive Homes of Moderate Cost, *McBride Winston & Co.*

Chapter III. The Rooms of the House

The Complete Home, *Laughlin*
The House, *Bevier*
Building a Home, *Desmond*
Houses for Town or Country, *Herbert*
From Cellar to Attic, *Van de Water*

Chapter IV. How to Ventilate the House

The Science of Living, *Sadler*
Ventilation and Heating, *Billings*
Practical Hygiene, *Harrington*
Open Air Schools, *Ayers*

Chapter V. How to Warm the House

Notes on Heating and Ventilation, *Allen*
Warming Buildings by Hot Water, *Dye*
The House Warming Manual, *Johnston*

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Kerosene Oil and Lamps, Health Department, State of Iowa
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Hints to Gas Consumers, *Gerhard*
Notes on Gas Lighting and Gas Fitting, *Gerhard*
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Chapter VII. How to Use Running Water in the House

American Sanitary Plumbing, *Lawler*
Sanitation, Water Supply, and Sewage Disposal of Country Houses, *Gerhard*
How to Drain a House, *Waring*
The Disposal of Household Wastes, *Gerhard*
The Sanitation of a Country House, *Bashore*
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The House Beautiful and Useful, *Elder*
Homes and their Decorations, *French*
The Decoration of Houses, *Wharton and Codman*
Principles of Home Decoration, *Wheeler*
Decorators and Decorating, *Wheeler*
Hopes and Fears for Art, *Morris*

Chapter IX. How to Furnish the House

The Furnishing of a Modest House, *Daniels*
Hints on House Furnishing, *Sparrow*
Furniture of Olden Times, *Morse*
Historic Styles in Furniture, *Robie*
Rugs, Oriental and Occidental, *Holt*

Chapter X. How to Care for the House

The Care of a House, *Clark*
Home Economics, *Parloa*
Household Economics, *Campbell*
The Easiest Way in Housekeeping and Cooking, *Campbell*
Household Bacteriology, *Elliott*
Cleaning and Renovating at Home, *Osman*

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Alcohol: How it Affects the Individual, the Community, and the Race, *Smith*

Physiological Aspects of the Liquor Problem, *Billings*, editor

The Liquor Problem: A Summary of Investigations conducted by the Committee of Fifty

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The Drink Problem, *Kelynack*, editor

Chapter XII. The Healthful City

Municipal Sanitation in the United States, *Chapin*

Principles of Sanitary Science and the Public Health, *Sedgwick*

Municipal Engineering and Sanitation, *Baker*

Civics and Health, *Allen*

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Chapter XV. The City Water and Ice

Clean Water and How to Get it, *Hazen*

The Filtration of Public Water Supplies, *Hazen*

CHAPTER XV — *continued*

Water Supply, *Mason*
Drinking Water, *Prudden*
Water Supply, Sewerage, and Plumbing of Modern City Buildings, *Gerhard*
Sanitation, Water Supply, and Sewage Disposal of Country Houses, *Gerhard*
The Health of the City, *Godfrey*

CHAPTER XVI. THE CITY REFUSE

The Disposal of Municipal Refuse, *Parsons*
The Economic Disposal of Town's Refuse, *Goodrich*
Disposal of Municipal Waste, Civic Improvement League of St. Louis
Sewage Disposal, *Kinnicutt, Winslow and Pratt*
Works on Sanitary Science

CHAPTER XVII. THE CITY STREETS

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Road Preservation and Dust Prevention, *Judson*
Modern Methods of Street Cleaning, *Soper*
Street Cleaning, *Waring*
Shade-trees in Towns and Cities, *Solotaroff*

CHAPTER XVIII. DISEASES DANGEROUS TO THE PUBLIC HEALTH

A Manual of Infectious Diseases, *Goodall and Washburn*
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A Practical Treatise on Diseases in Children, *Smith*
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The Crusade against Tuberculosis, *Flick*
Consumption, its Relation to Man and his Civilization, its Prevention and Cure, *Huber*
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CHAPTER XX. THE PREVENTION OF DISEASE

Mosquito or Man, *Boyce*
Mosquito Brigades and How to Organize them, *Ross*

CHAPTER XX — *continued*

The Prevention of Malaria, *Ross*
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CHAPTER XXI. THE SAFE CITY

Bucket Brigade to Flying Squadron, *Jenness*
Fighting a Fire, *Hill*
Fire Fighters and their Pets, *Downes*
Guarding a Great City, *McAdoo*
Police Administration, *Fuld*
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CHAPTER XXII. A NATIONAL EVIL

The Temperance Problem and Social Reform, *Rowntree and Sherwell*
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